

BRINE COOPERATING PARTIES

**SCREENING-LEVEL ECOLOGICAL RISK
ASSESSMENT**

FOR THE

BRINE SERVICE COMPANY SUPERFUND SITE

USEPA CERCLIS ID: TX0000605264

VOLUME III

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EXECUTIVE SUMMARY

This document presents the results of the Screening-Level Ecological Risk Assessment (SLERA) conducted as part of the on-going remedial investigation/feasibility study (RI/FS) of the Brine Service Company, Inc. Superfund Site (the “Site”), located in Corpus Christi, Nueces County, Texas. The Site is located in an industrial and petrochemical refining area situated between Interstate Highway 37 (IH-37) and Up River Road. The Site was proposed to the National Priorities List on September 13, 2001, and was placed on the National Priorities List on September 5, 2002. An Administrative Order on Consent for the RI/FS was executed by six companies¹ (Respondents) and the U.S. Environmental Protection Agency on October 21, 2009. The AOC was amended on November 17, 2009.

The Site consists of two former pit areas, referred to as the North Pit and the South Pit, bordered on the east by a drainage ditch (East Ditch). The North and South Pits were originally used for sand mining. The South Pit subsequently was developed into a disposal pit for drilling muds and refinery waste. The principal threat wastes remaining at the Site are the subsurface sludge, reworked soil/waste mixtures in the South Pit and LNAPL in the groundwater. Details about the Site setting and vicinity are contained in the RI Report (Volume I).

Consistent with the approved RI/FS Work Plan, the objectives of this Report are to:

- Describe the ecological service provided by the Site (Section 2);
- Compare the detected constituents to ecological benchmarks (Sections 3 and 4);
- Discuss the Scientific Management Decision Point (SMDP) from the Step 1 and 2 evaluation (Section 5);
- Develop trophic level models and evaluate the risk to trophic-level receptors as part of Step 3a (Section 6);
- Discuss uncertainties associated with the ecological risk assessment (Section 7); and
- Develop the SMDP for the Step 3a evaluation and the final recommendation for ecological evaluation (Sections 8 and 9).

Remedial Investigation Field Activities

The RI characterized the nature and extent of Site contamination through representative sampling of various environmental media, including:

- Waste materials,

¹ Anadarko E&P Company LP; ConocoPhillips Company; El Paso Merchant Energy-Petroleum Company; Hess Corporation; Sunoco, Inc. (R&M); Texaco, Inc.

- On-Site and off-Site surface and subsurface soils,
- On-Site and off-Site groundwater,
- On-Site and off-Site sediments, and
- On-Site and off-site surface water.

The field activities were performed using approved sampling techniques. Environmental samples were analyzed using approved analytical methods. Key findings from the RI Report are summarized in Section 2.0 of this report.

SLERA

The following sequence of data evaluation was implemented to prepare the SLERA:

1. The Site was divided into exposure areas based on operational history, evidence of releases, and terrestrial or aquatic setting.
2. The RI data for surface soil (0 to 0.5-feet below ground surface) and subsurface soil (1 to 2 feet below ground surface) from each exposure area were compared to ecological screening benchmarks.
3. Surface water and sediment (0 to 6-inches) data from each applicable exposure area were compared to ecological screening benchmarks.
4. Groundwater data for wells representative of the groundwater to surface water pathway were compared to ecological screening benchmarks.

Soils - Terrestrial Exposure

The South Pit, North Pit, and East Ditch (south segment) terrestrial exposure areas have detections of chemicals of potential concern (COPCs) in surface and subsurface soils above the screening criteria and detected bioaccumulative compounds. COPCs are retained for an upper trophic evaluation if they are: 1) non-bioaccumulative and were detected above the conservative benchmark or 2) are considered bioaccumulative and were detected. Metals, organochlorine pesticides, total polychlorinated biphenyls (PCBs), high molecular weight polycyclic aromatic hydrocarbons (PAHs), 2,4-dimethylphenol, benzaldehyde, bis(2-ethylhexyl) phthalate, carbazole, dibenzofuran, pentachlorophenol, and cyanide are COPCs retained for a Step 3a evaluation of the terrestrial exposure areas. The south segment of the East Ditch was evaluated both as an aquatic and terrestrial system in Step 2 because the area is considered intermittent.

The SMDP for these exposure areas utilizes a trophic level evaluation (Step 3a) and weight of evidence analysis that determines the potential for adverse impacts on ecological population is minimal. After the less-conservative analysis, the final COPCs for the South Pit soils include lead, mercury, zinc, and 4,4'-DDT and for the North Pit soils, barium, cadmium, lead, selenium, zinc, and mercury.

The risk evaluation was completed for the South and North Pit soils, but the quality of the habitat is such that ecological exposure is extremely limited. The majority of the Site consists of a mixture of commercial/industrial facilities, including associated parking lots, and maintained (mowed) grassy areas. The upper two feet of soils at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt which minimizes burrowing receptors. Documentation is presented that current and future land use is commercial/industrial.

However, COPC concentrations at some locations within the North and South Pit areas exceed the community receptor benchmarks by an order of magnitude or more. These locations present a potential acute risk to community receptors, or depending on proximity to the ditch, a potential transport pathway to sediments. The final scientific management decision point recommends an evaluation in the Feasibility Study for terrestrial COPCs with a hazard quotient exceeding 10.

Sediment and Surface Water – Aquatic Exposure

The data indicate that the East Ditch sediment and surface water contains COPC concentrations exceeding ecological screening criteria. Bioaccumulative COPCs were also detected. COPCs are retained for an upper trophic evaluation if they are: 1) non-bioaccumulative and were detected above the conservative benchmark or 2) are considered bioaccumulative and were detected.

The SMDP for these exposure areas utilizes a trophic level evaluation (Step 3a) that determines the potential for adverse impacts on ecological population, is minimal. The less conservative analysis considers the impact of the sediment cap installed in the south segment of the East Ditch. Risk to the benthic invertebrate community is limited to barium in the marine segment of the East Ditch.

Maximum concentrations of four pesticides, 4,4'-DDT, alpha-chlordane, heptachlor, and methoxychlor exceeded the Texas surface water quality standards (30 TAC 307). 4,4'-DDT occurs in either the upstream surface water or the Up River Road surface water at concentrations exceeding the Texas surface water quality standards. Methoxychlor and alpha-chlordane were only detected in one of the nine samples collected in the north segment of the East Ditch. Heptachlor was detected in five of the nine surface water samples collected in the North portion of the East Ditch. Two of the five detections are at concentrations greater than the chronic Texas Surface Water Quality Standard.

The snowy egret was assessed using only no-effect toxicity levels because this species represents special status bird species. The raccoon was the receptor representing mammals that may forage in the East Ditch. Following the 3a analysis there are no final COPCs for trophic level exposure.

The final scientific management decision point recommends No Further Action for the sediment and surface water in the East Ditch.

Findings

The SLERA evaluation described in the RI/FS Work Plan is complete. This report documents Steps 1, 2, and 3a of the ecological risk assessment process for the Brine Service Company Superfund Site. The overall terrestrial conclusion of Step 3a is that soils are impacted by ecological COPCs but that the quality of the habitat is limited. COPC concentrations at locations within the North and South Pit areas exceed the community receptor benchmarks by an order of magnitude or more. These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments. The final scientific management decision point recommends an evaluation in the Feasibility Study for terrestrial COPCs with a hazard quotient exceeding 10.

The Step 3a SMDP states that there is adequate information to conclude that ecological risks are negligible in the East Ditch and therefore a site-specific ecological risk assessment or remediation for the Site is not warranted. This SLERA concludes that additional assessment of ecological exposures of COPCs in surface and subsurface soils, sediment, and surface water at the Site is not warranted. The final SMDP recommendation for the Site, based on potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments, is the evaluation of terrestrial COPCs, barium, lead, mercury, selenium, and zinc, in the FS. The table below summarizes the final ecological COPCs for the Brine Service Company Superfund Site:

Terrestrial Community (North Pit Area)	Terrestrial Wildlife (North Pit Area)	Terrestrial Community (South Pit Area)	Terrestrial Wildlife (South Pit Area)	Marine Surface Water Community	Marine Sediment Community
Barium	Barium	Mercury	Lead	4,4'-DDT	Barium
Lead	Cadmium	Zinc	Zinc	alpha-Chlordane	
Mercury	Lead		4,4'-DDT	Heptachlor	
Selenium	Selenium			Methoxychlor	
Zinc	Zinc				

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ACRONYMS AND DEFINITIONS

bgs	below ground surface
COPCs	Chemicals of Potential Concern
CSM	Conceptual Site Model
DQO	Data Quality Objective
EMF	Exposure modifying factor
ERAGS	Ecological Risk Assessment Guidance for Superfund
ft ³ /s	cubic feet per second
HQ	Hazard Quotient
IH	Interstate Highway
km	kilometer
LNAPL	Light non-aqueous phase liquid
LOAEL	Lowest Observed Adverse Effects Level
mg/kg	milligram per kilogram
mg/L	milligram per liter
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effects Level
ORNL	Oak Ridge National Laboratory
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCL	Protective Concentration Level
ppt	parts per thousand
PRG	Preliminary Remedial Goal
Q _{gw}	groundwater flow rate
Q _{sw}	surface water flow rate
RI/FS	Remedial Investigation/Feasibility Study
Riparian soil	Narrow strip of land that lines the bank of a stream or other water body
Sediment	Loose particles of sand, clay, or silt that settle at the bottom of water body
SLERA	Screening-Level Ecological Risk Assessment
SMDP	Scientific Management Decision Point
SQuiRT	Screening Quick Reference Tables
SSL	Soil Screening Levels
Subsurface Soil	Shallow soil interval from 1 foot to 2 foot below the surface
Surface Soil	Shallow soil interval to 6-inches below the surface
SVOC	Semivolatile Organic Compound
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNRCC	Texas Natural Resource Conservation Commission (predecessor agency to TCEQ)

TRRP	Texas Risk Reduction Program
TRV	Toxicity Reference Value
TxDOT	Texas Department of Transportation
UCL	Upper Confidence Limit
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTU	Upper transmissive Unit
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents the screening-level ecological risk assessment (SLERA) conducted as part of the remedial investigation/feasibility study (RI/FS) of the Brine Service Company, Inc. Superfund Site (the “Site”). The Site is located in Corpus Christi, Nueces County, Texas, in an industrial and petrochemical refining area situated between Interstate Highway 37 (IH-37) and Up River Road (Figure 1). The Site was proposed to the National Priorities List on September 13, 2001, and was placed on the National Priorities List on September 5, 2002. An Administrative Order on Consent for the RI/FS was executed by six companies² (Respondents) and the U.S. Environmental Protection Agency (USEPA) on October 21, 2009. The AOC was amended on November 17, 2009.

The SLERA was conducted to evaluate whether one or more constituents detected in soil, sediment, surface water, or groundwater at the Site have the potential to cause unacceptable risk and warrant further evaluation with respect to ecological receptors. Ecological risk activities for the Site were conducted using the following guidance developed by USEPA and the Texas Commission on Environmental Quality (TCEQ):

- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997) and
- *Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas* (TCEQ, 2017a).

1.1 Site Location and History

The Site is in Corpus Christi, Nueces County, Texas, along the north side of IH-37, northeast of the intersection of the IH-37 feeder road and Goldston Road (Figure 2). The Site is comprised of Lots 2 through 8 of Block 1, Goldston Addition as well as a Texas Department of Transportation (TxDOT) drainage ditch. The Site is bounded on the west by Goldston Road, on the east by the Buckeye Texas Processing Refinery (Buckeye), on the south by the frontage road to IH-37, and to the north by Up River Road east of the TxDOT drainage ditch and by a parking lot owned by Buckeye west of the ditch (Figure 2).

The Site consists of two former pit areas, referred to as the North Pit and the South Pit. The North and South Pits at the Site were originally used for sand mining and the South Pit was subsequently used for disposal of drilling muds and refinery wastes (TNRCC, 2000). The pits were subsequently backfilled. The historical footprint of the South Pit area is now occupied by a vacant lot and portions of a construction equipment repair shop (Robert’s Equipment Sales and Service [Robert’s

² Anadarko E&P Company LP; ConocoPhillips Company; El Paso Merchant Energy-Petroleum Company; Hess Corporation; Sunoco, Inc. (R&M); Texaco, Inc.

Equipment]) and an adult video store (Adult Video). The historical footprint of the North Pit was occupied by a commercial tire repair facility and a fabricating shop, which is currently vacant.

In the 1956 aerial photograph, the Site appeared to be developed with excavation associated with mining sand material occurring in the southern part of the Site in the vicinity of the North and South Pits (TNRCC, 2000). By 1957, the pits contained liquids which persisted (intermittently for the North Pit as depicted in the 1959 aerial photograph) through at least 1962. By 1965, the area of the North Pit was backfilled and the area of the South Pit was partially backfilled. The South Pit appeared to be incrementally backfilled until 1973 when it was completely backfilled. The initial development of the southern portion of the Site was a construction laydown area. By 1997 the Site appeared as it is presently with Robert's Equipment and Adult Video along IH-37.

A drainage ditch (East Ditch) located along the east side of the Site empties into a northwest trending ditch, which extends to Tule Lake. Based on a review of historical aerial photographs and topographic maps, it appears that the course of the East Ditch has evolved and matured over time from a small drainage swale to a more engineered drainage channel.

Several pipeline easements traverse the Site. The Site was first identified as having environmental impacts in November 1997 when Koch Pipeline Company notified the Texas Natural Resource Conservation Commission (TNRCC; now TCEQ) of impacted soils in an excavation trench for an interconnecting pipeline. Approximately 3,000 cubic yards of soil were excavated and a TNRCC inspector observed visible staining and light non-aqueous phase liquids (LNAPL) in the groundwater seeping into the excavation. Laboratory results from soil samples collected from the excavated material indicated elevated concentrations of total petroleum hydrocarbons, total metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) (TNRCC, 2000). Subsequently, the TNRCC conducted a Site Screening Inspection (TNRCC, 2000).

An RI/FS Work Plan (URS, 2010) for the Site, which included the SLERA Work Plan, was approved by USEPA in August 2010. Phase I RI activities were conducted at the Site from September to December 2010 to assess the nature and extent of affected environmental media at the Site. The data collected during the Phase I RI formed the basis for a preliminary screening-level ecological risk assessment (URS, 2011a). The Phase II RI Technical Memorandum (URS, 2011b) and the preliminary SLERA recommended additional sample collection to fill data gaps identified in the Phase I investigation. Phase II data collection was completed in early 2014. In addition, a field investigation to evaluate the sources of sheen and LNAPL observed in the East Ditch in January 2017 was conducted from March through May 2017.

1.2 Comparison of TCEQ and USEPA SLERA Elements

The USEPA (1997) guidance document, Ecological Risk Assessment Guidance for Superfund (ERAGS), describes an eight-step process. This eight-step process is depicted in Figure 3. TCEQ's approach uses 10 Required Elements per 30 Texas Administrative Code (TAC) 350.77(c).

The elements of the ecological risk assessment process under the Texas Risk Reduction Program (TRRP) are also depicted in Figure 3 and are summarized below:

1. Comparison of concentrations to ecological screening benchmarks;
2. Identification of ecological communities, representative species and potentially complete exposure pathways;
3. Development of a conceptual site model (CSM);
4. Discussion of chemical of potential concern (COPC) fate and transport and toxicological profiles;
5. Preparation of conservative exposure assumptions and intake equations that account for total exposure, no observed adverse effect level (NOAEL) and lowest observed adverse effect level (LOAEL) values;
6. Utilize an ecological hazard quotient (HQ) methodology to compare exposures to the NOAELs in order to eliminate COPCs that pose no unacceptable risk (i.e., NOAEL HQ less than or equal to 1);
7. Justify the use of less-conservative assumptions (e.g., a larger home range) to adjust the exposure and repeat the HQ exercise in Required Element 6 eliminating COPCs that pose no unacceptable risk based on comparisons to the NOAELs and LOAELs;
8. Develop an uncertainty analysis which discusses the major areas of uncertainty associated with the screening-level ecological risk assessment;
9. Calculate medium-specific risk-based criteria bounded by the NOAEL and the LOAEL; and
10. Make a recommendation for managing ecological risk based on the final ecological risk-based criteria.

The first phase of the SLERA includes USEPA's Step 1 (screening-level problem formulation and ecological effects evaluation) (*Section 2*) and Step 2 (screening-level exposure estimate and risk calculation) (*Sections 3 and 4*). The TCEQ's Required Elements 1 through 4 correspond to USEPA's Step 1 and 2 (Figure 3). Section 1.4 of the USEPA's 1997 guidance summarizes the following components of Step 1:

- The environmental setting with constituent concentrations from each medium (TCEQ Required Elements 1 and 2);
- Contaminant Fate and Transport (TCEQ Required Element 4);
- Mechanism of Ecotoxicity (TCEQ Required Element 4); and
- Complete Exposure Pathways (TCEQ Required Element 3).

Section 2.5 of USEPA's 1997 guidance summarizes the components in Step 2:

- Exposure estimates based on conservative assumptions and maximum concentrations present (TCEQ Required Element 1); and
- HQs indicating which, if any, contaminants and exposure pathways might pose ecological threats. Utilizing the TCEQ Required Element 1, the maximum concentration detected in each medium per exposure area was compared to TCEQ benchmarks to calculate a HQ. If a benchmark is not available and the analyte was detected, the open literature was searched for a value and the selection referenced.

Following Steps 1 and 2 of the USEPA process and the first four TCEQ required elements, the process moves into the Scientific Management Decision Point (SMDP) (*Section 5*). There are three possible decisions at this point:

1. There is adequate information to conclude that the ecological risks are negligible and therefore no need for remediation on the basis of ecological risk;
2. The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3; or
3. The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

This SLERA includes an USEPA Step 3a (TCEQ Required Elements 5 through 8) trophic level analysis as described in Section 5.0 of the Work Plan and presented in *Section 6* of this SLERA report. The following species were used for food web modeling for both the conservative and less-conservative evaluations:

- Terrestrial System
 - Herbivorous mammals – Eastern cottontail, Texas pocket gopher (1 to 2-foot zone only)
 - Omnivorous mammal – White-footed mouse, nine-banded armadillo (0 to 0.5-foot soil zone for food web analysis and 1 to 2-foot soil zone for incidental ingestion)
 - Carnivorous mammal – Coyote
 - Herbivorous Bird – Mourning dove
 - Omnivorous Bird – American robin
 - Carnivorous Bird – Red-tailed hawk
 - Reptiles – Texas indigo snake, listed as a Texas threatened species
- Aquatic System (East Ditch)
 - Omnivorous mammals – Raccoon

- Carnivorous Bird – Snowy egret; the snowy egret is a surrogate for the wood stork, reddish egret and white-faced ibis – listed as Texas threatened species

Another SMDP occurs following the Step 3a/Required Elements 5 through 8 to determine whether additional steps in the ecological risk process are warranted (e.g., USEPA Steps 3b – 7/TCEQ Tier 3) (*Section 8*).

In addition to the traditional elements described above, this SLERA also includes the following items as described in Section 4.1.2 of the Work Plan (URS, 2010):

- An analysis of the soil pH in regards to retaining aluminum as a COPC;
- An analysis of relevance/relationship of COPC presence at the Site in conjunction with soil background and upstream sediment/surface water data comparisons. This information is presented in the uncertainty section (*Section 7*).
- An analysis of data quality with special consideration given to when the ecological screening value is less than the sample detection limit.

In January 2017, the TCEQ released an updated version of their ecological risk guidance (RG-263), revised benchmarks (RG-236B), and an interactive soil and sediment wildlife Protective Concentration Level (PCL) Database (the “PCL Database”) (TCEQ, 2017c). The PCL Database follows the TCEQ required elements through Required Element 7 as they pertain to wildlife (i.e., no benchmark screening). In addition to the PCLs, it can also be used as a resource for uptake factors and wildlife exposure parameters. This SLERA uses the uptake factors for those COPCs listed in the PCL Database and the soil or sediment ingestion rates for the species listed above. All of the original references for the COPC and species-specific exposure factors are provided in the PCL Database.

There are two significant differences in implementation of the ecological risk assessment process between TCEQ and the EPA: 1) Texas applies the concept of disturbed ground to remove or minimize ecological exposure pathways, whereas EPA has a broader definition of “habitat” and 2) TCEQ does not require clean-up levels for soil community receptors (i.e., plants and earthworms), whereas EPA requires clean-up levels to be based on soil community receptors. This SLERA has been completed using the EPA approach; however, the uncertainty section discusses some of the limitations and assumptions required to implement that approach.

1.3 Summary of Data Quality Objective Process

The development of data quality objectives (DQOs) was presented in the RI/FS Work Plan and the Quality Assurance Project Plan (URS, 2010). This section summarizes the DQOs that are relevant to the SLERA.

1. Determine whether COPC concentrations in surface soils exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or

whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the on-Site surface soils require No Further Action.

2. Determine whether COPC concentrations in East Ditch sediments exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the sediments require No Further Action.
3. Determine whether COPC concentrations in East Ditch surface water exceed site-specific risk-based ecological criteria and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the surface water require No Further Action.
4. Determine where COPC concentrations in East Ditch surface water exceed applicable state and federal water quality standards and warrant additional investigation or an evaluation in the FS, or whether COPC concentrations are equal to or less than applicable state and federal water quality standards and the surface water require No Further Action.
5. Determine whether COPC concentrations in groundwater discharging to surface water exceed site-specific risk-based ecological criteria and warrant off-Site assessment or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific ecological criteria and require No Further Action.
6. Determine whether COPC concentrations in groundwater discharging to surface water exceed applicable state and federal surface water quality standards and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than applicable state and federal water quality standards and the groundwater require No Further Action.

1.4 SLERA Objectives

The objectives of this report include the following for the screening-level problem formulation, effects evaluation, exposure estimate and risk characterization phase (Steps 1 and 2):

- Present a CSM for the Site (*Section 2*) updated for data developed during the RI.
- Compare the relevant soil, riparian soil, surface water, groundwater and sediment data to the ecological screening values (*Sections 3 and 4*);
- Identify which detected analytes are considered bioaccumulative (*Sections 3 and 4*);
- Identify those COPCs with sample detection limits that are greater than the screening value and assess overall data quality and applicability of the data for the ecological evaluation (*Section 7*).
- Develop a SMDP for each of the ecological exposure areas (*Sections 5 and 8*).

The objectives of this report include the following for the screening-level trophic analysis (Step 3a):

- Develop trophic exposure models for those pathways identified in the CSM for terrestrial and aquatic receptors (*Section 6*).
- Identify, for those COPCs with HQs greater than 1, receptors and pathways that may require additional assessment beyond the Step 3a analysis (*Section 6*).
- Evaluate those COPCs in the background or upstream sampling locations to discern those that may or may not be Site related and present this information in the uncertainty section of the report (*Section 7*).
- Develop a SMDP for each of the exposure areas (*Section 8*) and define the study questions for a baseline ecological risk assessment, if one is necessary.
- Determine if COPCs have migrated from source areas and resulted in off-Site impacts or threats of impacts in addition to on-Site threats or impacts (TCEQ Required Element 4 and ERAGS Step 1).

1.5 Report Structure

This SLERA report consists of the following sections:

- Section 1, Introduction, provides a statement of the purpose of the report, describes the Site history and background, and outlines the structure of the report.
- Section 2, Screening-Level Problem Formulation and Ecological Effects Evaluation (Step 1), describes the physical characteristics of the Site in order to determine the features that affect the transport of contaminants to ecological receptors. The CSM is presented and the basis of the screening values is discussed.
- Section 3, Screening-Level Exposure Estimate and Risk Characterization - Soils (Step 2), describes the ecological review of analytical results compared to the screening values for each of the soils exposure areas.
- Section 4, Screening-Level Exposure Estimate and Risk Characterization - Surface Water, Sediment, and Riparian Soils (Step 2), describes the ecological review of analytical results compared to the screening values for the East Ditch exposure area.
- Section 5, Screening-Level Scientific Management Decision Point (Step 2), summarizes the SMDP for each of the exposure areas following the screening value analysis.
- Section 6, Trophic Level Analysis (Step 3a), summarizes the upper trophic level analysis by exposure area.
- Section 7, Uncertainty Analysis, describes the major uncertainties associated with the SLERA (Steps 1, 2 and 3a).

- Section 8, Trophic Analysis Scientific Management Decision Point (Step 3a), summarizes the SMDP for each of the exposure areas following the trophic level analysis and provides a resolution of the decision statements.
- Section 9, Risk Management Recommendations, presents the recommendations for managing ecological risk at the Site.
- Section 10, References, lists the data sources used to compile this report.

2.0 SCREENING-LEVEL PROBLEM FORMULATION/ECOLOGICAL EFFECTS EVALUATION (STEP 1)

The screening-level problem formulation and ecological effects evaluation provides the following:

- Environmental setting and COPCs known to exist at the Site and the maximum concentrations present for each medium;
- Contaminant fate and transport mechanisms that might exist at the Site;
- The mechanisms of ecotoxicity associated with COPCs and likely categories of receptors that could be affected;
- The complete exposure pathways that might exist at the Site from COPC sources to receptors that could be affected; and
- Screening ecotoxicity values equivalent to no effect levels based on conservative assumptions (USEPA, 1997).

2.1 Environmental Setting

The Site is located in Corpus Christi, Nueces County, Texas, along the north side of IH-37, northeast of the intersection of the IH-37 feeder road and Goldston Road (Figure 2). The Site consists of two pit areas, referred to as the North Pit and the South Pit (Figure 2). The North and South Pits at the Site were originally used for sand mining and the South Pit was subsequently used for disposal of drilling muds and refinery wastes (TNRCC, 2000). The pits were subsequently filled in. The historical footprint of the South Pit area is now occupied by a vacant lot and portions of Robert's Equipment and Adult Video. The historical footprint of the North Pit was occupied by a commercial tire repair facility and a fabricating shop. Several pipeline easements traverse the Site (Figure 4).

The Site is currently in commercial/industrial use and is expected to remain commercial/industrial in the future. Various commercial/industrial buildings, including Robert's Equipment, Adult Video, and warehouse buildings for the former commercial tire repair facility and fabricating shop, are located within the Site boundaries (Figure 4). Lot 7 (Adult Video) is within the city limits of the City of Corpus Christi. The remainder of the Site is located within the extra-territorial jurisdiction of the City of Corpus Christi. Land use within the Site is either zoned commercial (Adult Video) or light industrial (COCC, 2017). The Site is located within the Port of Corpus Christi Inner Harbor Port Related District (POCC, 2017) and Industrial District Number One (COCC, 2017). In July 1990, The Goldston Corporation recorded an Industrial District Agreement with the City of Corpus Christi for the 19.575 acres which comprises Lots 1 through 8 of the Goldston Addition. According to the City of Corpus Christi geographic information system map viewer, future land use will be heavy industrial. Appendix A-1 contains zoning maps and districts.

In addition to Site commercial/industrial activities, Buckeye is located east of the Site and the Nueces Power Equipment facility is located west of the Site. Buckeye operates a splitter unit that

processes condense into liquefied petroleum gases, light and heavy naphtha, kerosene, diesel, and atmospheric tower bottoms. In addition, Buckeye provides refrigerated LPG storage. The total petroleum storage capacity is approximately 3.3 million barrels (Buckeye, 2017). Nueces Power sells, leases, and repairs heavy construction equipment (NPE, 2017). Other industrial facilities located west of the Site along Goldston Road include Jabco, Inc. (a freight shipping company) and Repcon (turnaround support for refineries and chemical plants). The Flint Hills Resources West Refinery is located approximately 1.25 miles northwest of the Site and the Citgo Refinery West Plant is located approximately 0.5 mile east of the Site.

A drainage ditch (East Ditch) located along the east side of the Site empties into a northwest trending ditch, which extends to Tule Lake. Based on a review of historical aerial photographs and topographic maps, it appears that the course of the East Ditch has evolved and matured over time from a small drainage swale to a more engineered drainage channel. A roadside drainage ditch on the south side of Up River Road flows into the East Ditch.

The environmental setting at the Site can be separated into two terrestrial and three aquatic categories that constitute ecological areas for evaluation in this SLERA:

- Terrestrial Area (Figure 5)
 - Soils from the South Pit area, including soils on the east and west side of the South Pit comprising approximately 6.9-acres;
 - Soils from the North Pit area, including soils on the east and west side of the North Pit comprising approximately 4.7-acres;
- Aquatic Areas (Figure 6)
 - East Ditch Upstream/Background;
 - East Ditch South (includes riparian analysis) comprising approximately 0.60-acres south of the ‘S’ curve; and
 - East Ditch North comprising approximately 2.2-acres north of the ‘S’ curve.

A fourth aquatic area, the Up River Road drainage ditch, was evaluated in this SLERA to identify potential anthropogenic impacts to COPC concentrations identified at the confluence of the East Ditch and the Up River Road drainage ditch.

2.1.1 Habitat Evaluation

On October 19, 2010 a habitat evaluation was conducted for the Site by URS ecologists. The primary purpose of the site visit was to evaluate the area for the potential presence of special status species. “Special status species” includes those species identified by the Federal Endangered Species Act (50 Code of Federal Regulations 17) or by the State of Texas as endangered, threatened, or as a candidate for listing. This list also includes those species identified by the State

of Texas as “rare” but with no regulatory status. Appendix A-2 contains the assessment for special status species for the Site.

The habitat evaluation determined that ecological resources at the Site are limited for terrestrial and aquatic receptors by the maintenance of the grassy areas, industrial activities, and the intermittent nature of the drainage channel. It is unlikely that upper trophic level special status species would utilize the Site for nesting or foraging. Although the habitat of the north segment of the East Ditch could support several special status species (e.g., reddish egret or white-faced ibis), it is unlikely that they will be present due to the close proximity of roadways and commercial/industrial facilities. More suitable habitat is available nearby in Tule Lake and a colonial water bird rookery is located approximately 2.5 miles north of the Site in Nueces Bay (Anchor, 2012). Some species of special status plants and one snake (Texas indigo snake) could be present on the Site based on habitat conditions.

Based on the habitat evaluation and a review of the special status species listing for Nueces County, the Texas indigo snake (*Drymarchon corais erebennus*), wood stork (*Mycteria americana*), reddish egret (*Egretta rufescens*), and white-faced ibis (*Plegadis chihi*) are evaluated in the SLERA because of their potential presence.

2.1.2 Terrestrial Environmental Setting

The majority of the Site consists of a mixture of commercial/industrial facilities, including associated parking lots, and maintained (mowed) grassy areas. Significant ecological habitat was not observed within the commercial/industrial facilities and their parking lots. Figure 4 shows the non-habitat (improved) areas of the site and pipeline corridors. The eastern boundary of the property is defined by the East Ditch and its riparian vegetation. The maintained grassy areas were dominated by non-native grasses including Bermudagrass (*Cynodon dactylon*), guineagrass (*Urochloa maxima*) and Kleberg bluestem (*Dichanthium annulatum*) and native grasses such as slimspike windmill grass (*Chloris andropogonoides*). Also within the grassy area were a few scattered shrubs/small trees including white leadtree (*Leucaena leucocephala*) and honey mesquite (*Prosopis glandulosa*).

The upper two feet of soils at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt. Approximately 90% of the North Pit area boring logs and approximately 80% of the South Pit area boring logs described gravel and/or caliche within the top two feet. The lots were improved with 6 to 12 inches of caliche base and portions were paved with a hot asphalt mix (Goldston, 2010). The surface soil pH values ranged from 7.05 to 8.56 units, consistent with those reported for calcareous soils (pH range 7.5 to 8.5; Idowu and Flynn, 2015). Approximately 40% of the North Pit and South Pit areas are covered by buildings or non-vegetative cover such as asphaltic or caliche base. In addition, approximately 75% of the surface of Lot 6 contains equipment and other materials. Because of the soil type, commercial/industrial facilities, and mowing, the use of the North and South Pit areas as terrestrial habitat is limited.

Photos 1-5 in Appendix A-2 show the grassy portions of the Site, including the commercial/industrial facilities. Figure 5 shows the South Pit and North Pit soil sample locations.

2.1.3 East Ditch Environmental Setting

The East Ditch is approximately 4,200 feet long and the headwaters are located south of the Site in the agricultural fields between Leopard Street and the IH-37 feed road. TxDOT has a permanent easement within the East Ditch between IH-37 and Up River Road. The ditch appears on the National Wetlands Inventory and is classified as riverine, unknown perennial, unconsolidated bottom (R5UBH) (USFWS, 2017). The ditch is directed to the north side of IH-37 through box culverts. On the northern side of IH-37, the ditch parallels the South Pit portion of the Site for approximately 750 feet before it enters a concrete ‘S’ curve approximately 250 feet long. Although the ‘S’ curve is concrete lined, numerous breaks in the concrete and sediment collected on top of the concrete support vegetation. The ditch exits the ‘S’ curve and proceeds north to the box culverts at Up River Road for approximately 1,100 feet.

The East Ditch enters the northwest drainage ditch which is north of and parallel to Up River Road. The northwest drainage ditch is adjacent to the Port of Corpus Christi dredge management spoil area. This ditch is considered a wetlands and is classified as palustrine, emergent, persistent, regularly flooded, excavated by man (PEM1Cx). The northwest drainage ditch discharges to Tule Lake, approximately 200 feet north of Up River Road. The western portion of Tule Lake is classified as estuarine, intertidal, emergent, persistent, regularly flooded, (E2EM1N) and the remainder of Tule Lake is classified as estuarine, intertidal, unconsolidated shore, irregular exposed (E2USM) (USFWS, 2017). The nearest designated segment is Corpus Christi Inner Harbor (Segment No. 2484). Segment No. 2484 is not currently listed on the inventory of impaired and threatened waters (the 2014 Clean Water Act Section 303(d) list) (TCEQ, 2015).

Observations during Site visits from 2010 to 2014 indicated that the south segment of the ditch was ephemeral, having flow only after precipitation, while the north segment was perennial. During the 2017 Site visits, the south segment was observed to have transitioned from an ephemeral drainage ditch to an intermittent stream due to certain anthropogenic effects occurring in the vicinity of the adjacent Buckeye facility to the east, including potential changes in surface water drainage patterns and the addition of permitted outfalls along the ditch. Surface water gauging measurements conducted from March to November 2017 indicate that the south segment of the ditch returns to the dry conditions in between rainfall events (intermittent).

Although narrow, the riparian corridor along the East Ditch contained shrubs and small trees including honey mesquite (*Prosopis glandulosa*), white leadtree (*Leucaena leucocephala*), and sugar hackberry (*Celtis laevigata*) along its entire length. Figure 6 shows the East Ditch investigation units and the surface water/sediment sample locations.

Within the south segment of East Ditch, upstream of the concrete-lined ‘S’ curve, the riparian corridor included Mexican ash (*Fraxinus berlandieriana*) in addition to the species listed above.

Dominant plants found within the channel included white leadtree and guineagrass. The dominant species observed within the channel included Kleberg bluestem, guineagrass, white leadtree, and buffelgrass (*Pennisetum ciliare*).

The north segment of the East Ditch contained water at the time of the October 19, 2010 site visit. In addition to the riparian species listed, retama (*Parkinsonia aculeata*), dwarf palmetto (*Sabal minor*), Johnsongrass (*Sorghum halepense*), Kleberg bluestem, and guineagrass were also present in the riparian corridor. The banks of the channel were lined in places with Gulf cordgrass (*Spartina spartinae*) and cattails (*Typha sp.*) were observed within the channel, adjacent to the Up River Road culvert.

Salinity measurements collected during the RI ranged from 0.273 parts per thousand (ppt) at EDSW02 to 15.6 ppt at EDSW09. The distribution indicates that the segment of the East Ditch south of the ‘S’ curve is classified as freshwater, while the segment north of the ‘S’ curve is classified as marine.

2.2 Sample Collection and Analytical Data

Figures 5 and 6 show the terrestrial and surface water/sediment sampling locations, respectively. Samples were collected in accordance with standard operating procedures provided in the RI Work Plan (URS, 2010).

2.2.1 Soil

Soil samples (Figure 5) were collected from the 0 to 0.5-feet below ground surface (bgs) and from 1 to 2-feet bgs in the terrestrial areas. Sample data from the 0 to 0.5-foot soil interval were evaluated for risk to terrestrial receptors. This is the most biologically active zone for the soil column. Sample data from the 1 to 2-foot soil interval were evaluated for risks to burrowing receptors. Samples collected in 2010 were analyzed for metals (including mercury), cyanide, pesticides, polychlorinated biphenyls (PCBs), VOCs, and SVOCs. Samples collected between 2011 and 2017 were analyzed for specific metals, VOCs, and SVOCs.

Constituents (detected and non-detected) are shown on Table 1 for the South Pit soil exposure area and Table 2 for the North Pit soil exposure area. Appendix B contains the ecological data for each sample location.

2.2.2 Sediment, Surface Water and Riparian Soils

Sample data from the East Ditch is organized into the following exposure areas:

- South segment (freshwater) of the East Ditch;
- Riparian soil samples from the south segment of the East Ditch; and
- North segment (marine) of the East Ditch.

Samples were collected from the top 6 inches of sediment. This is the most biologically active zone in the sediment column. Three locations indicative of the riparian transitional area along the

south segment of the East Ditch were sampled. Surface water samples were collected from areas of accumulated surface water in both the East Ditch and the Up River Road ditch.

Figure 6 shows the sample locations. The data from these exposure areas are summarized in Tables 3 through 8 with the data reported for each sample location provided in Appendix B.

2.2.3 Groundwater

As discussed in Section 3.11.3 of Volume I, three lines of evidence support the hydrogeologic model that the upper transmissive unit (UTU) is not in connection with the East Ditch in the vicinity of the South Pit and is in connection with the East Ditch in the vicinity of the North Pit. These three lines of evidence include field observations of the East Ditch made during field activities, the potentiometric maps, and the relationship of the top of the saturated transmissive unit to the bottom of the East Ditch. While the UTU is not in hydraulic communication with the East Ditch in the vicinity of the South Pit, periodic transport of LNAPL and sheen-forming COPCs to the surface water from the UTU through the overlying clayey silts and sands was observed in 2017. Between November and December 2017, a sediment cap was installed in the south segment of the East Ditch to prevent surface water from creating a wetting condition that allows for transport of COPCs from the UTU to surface water through the overlying clays (Figure 6). The cap is a composite liner system (geosynthetic clay liner bonded to a 60-mil high density polyethylene geomembrane) covered with 12 inches clay and erosion control materials. The dimensions of the cap are approximately 300 feet long and 15 feet wide (BCP, 2018).

Groundwater samples were collected from a monitoring well installed adjacent to the south segment of the East Ditch, MWGW02 (Figure 5), for the evaluation of the potential groundwater to surface water pathway. The data for the evaluation of the potential discharge of groundwater to surface water in the south segment of the East Ditch are summarized in Table 9. The data reported for each sample location is provided in Appendix B.

Groundwater in the area of the North Pit may discharge to the north segment of the East Ditch. Based on field observations of the East Ditch made during field activities, the potentiometric maps, and the relationship of the top of the saturated transmissive unit to the bottom of the East Ditch, the UTU is in connection with the East Ditch in the vicinity of the North Pit.

Groundwater samples were collected from monitoring wells installed adjacent to the north segment of the East Ditch, MWGW04, MWGW05, MWGW15, and MWGW16 (Figure 5), for evaluation of the groundwater to surface water pathway. In order to compare groundwater concentrations to ecological surface water criteria that are based on dissolved concentrations, samples for the analysis of metals were collected both unfiltered and filtered. Samples were either field or laboratory filtered using a 0.45-micron filter.

The data for the evaluation of the discharge of groundwater to surface water in the north segment of the East Ditch are summarized in Table 10. The data reported for each sample location is provided in Appendix B.

2.2.4 Off-Site and Background Samples

Soil, sediment, and surface water samples were collected to evaluate the potential for anthropogenic contributions to COPCs detected on the Site:

- Off-Site soils at undeveloped property owned by Catholic Solitudes;
- Upstream/Background segment of the East Ditch; and
- Up River Road drainage ditch.

Surface soil samples were collected at thirteen locations approximately two miles east of the Site on undeveloped property owned by Catholic Solitudes. Background surface soil samples collected were analyzed for metals, pesticides, PCBs, and SVOCs. Background was calculated from this data as the lower of the background maximum concentration or the 95% upper prediction limit (UPL). If the maximum concentration or the 95% UPL is lower than the Texas-specific median background concentration, the Site background defaulted to the Texas-specific median background concentration. Table 11 summarizes the detected and non-detected constituents for the background surface soil samples. The data reported for each sample location is provided in Appendix B.

Surface water and sediment background samples were collected from the portion of the East Ditch upgradient from the Site (Figure 6). Tables 12 and 13 summarize the detected and non-detected constituents for background surface water and sediment, respectively. The data reported for each sample location is provided in Appendix B.

Surface water and sediment samples were collected from a drainage ditch adjacent to Up River Road (Figure 6) to identify potential anthropogenic impacts from off-site sources to the confluence of the East Ditch and the Up River Road drainage ditch. The Up River Road drainage ditch receives runoff from the road and stormwater outfalls. The Up River Road drainage ditch conveys storm water to the East Ditch culvert from both directions (east and west) which includes Southern Minerals Road west to the East Ditch culvert and from 300 feet east of Goldston Road east to the East Ditch culvert (NCDPW, 2007). Tables 14 and 15 summarize the detected and non-detected constituents for Up River Road surface water and sediment, respectively. The data reported for each sample location is provided in Appendix B.

2.3 Ecotoxicity and Potential Receptors

Understanding the toxic mechanism of a constituent helps to evaluate the importance of potential exposure pathways and to focus the selection of assessment endpoints. Some constituents, for example, affect primarily vertebrate animals by interfering with organ systems unique to vertebrates and not found in invertebrates or plants (USEPA, 1997). Mechanisms of ecotoxicity are discussed in ecotoxicity profiles provided in the PCL Database (TCEQ Required Element 4).

The SLERA focuses on assessment of ecological communities and not individual- or population-based evaluation of upper trophic level receptors. Ecological communities are a collection of plant

and animal populations occupying the same habitat in which the various species interact with one another. However, for purposes of the SLERA, “communities” refers to those groups whose exposure to ecological COPCs can be evaluated in terms of the media in which they reside (TCEQ, 2017a). These communities consist of soil invertebrates, terrestrial vegetation, benthic invertebrates, and water column receptors (e.g., invertebrates and small fish).

The development of habitat-specific food webs with upper trophic level receptors identified for the Site occurs in ERAGS Step 3a/TCEQ Required Element 5 (*Section 6*).

2.4 Complete Exposure Pathways and Generic Assessment Endpoints

Evaluating potential exposure pathways is one of the primary tasks of the screening-level ecological characterization of a site (TCEQ Required Element 2). For an exposure to be complete, a constituent that is present at a source of environmental release or one that has migrated from a source of release must be taken up by the ecological receptors via one or more exposure pathways and exposure routes. Identifying complete exposure pathways allows the assessment to focus on only those constituents that could be taken up by ecological receptors via the pathways/routes by which exposure could occur.

The CSM contains relevant exposure pathways and routes of exposure for the vertebrate wildlife species and community-level receptors evaluated in the SLERA for terrestrial and aquatic pathways. The CSM summarizes exposure media, potentially exposed receptors, and potentially complete exposure pathways and routes, and is developed based on the available data and information for the Site. The CSM (Figure 7) provided in the SLERA Work Plan was refined based on the Site RI data.

2.4.1 Sources and Release Mechanisms

The primary sources (sources with the largest volume of impacted media) of COPCs at the Site are the now buried North and South Pits and anthropogenic activities such as agriculture, pipeline operations, oil and gas wells, production facilities, and current businesses. Potential primary release mechanisms from these sources included:

- historical and current infiltration and percolation from the pits into adjacent subsurface soils and groundwater;
- historical spills during Site operations from the loading and unloading of wastes at the South Pit to the Site soil; and
- historical discharges (overtopping) and storm water and sediment runoff from the South Pit to the North Pit or East Ditch during operation.

The pits were constructed in a former sand quarry (TNRCC, 2000). Waste placed within the South Pit potentially migrated to the adjacent subsurface soils and groundwater through dissolution or sorption onto fine particulate matter. If dissolved or sorbed, the chemicals could migrate with the groundwater.

COPCs within the waste liquids and sludge placed in the South Pit may have been released to the Site soils, the North Pit area, and/or the East Ditch by discharges (overtopping), spills or leaks to surface soil, or may have migrated into soil through infiltration or percolation to subsurface soils. Rain and surface water infiltration through impacted soil leaches the more water-soluble portions of the fluids resulting in the water-miscible fluids mixing with the groundwater and, depending on site characteristics, migrating laterally through sand and silty layers.

COPCs residing in surface soil (0 to 2-feet bgs), such as in vicinity of the pits, may have been mobilized during Site operations and transported by wind erosion, volatilization, or episodic surface runoff. The conceptual model indicates that COPCs in surface soil may have migrated vertically to subsurface soil by desorption and leaching processes and potentially entered groundwater. Depending on the subsurface stratigraphy, release potential to subsurface soils would be low in areas constructed over the impermeable native clay, while the release potential to subsurface soils would be higher in areas constructed in a transmissive zone.

COPCs residing in subsurface soils (> 2-feet bgs) may migrate vertically to groundwater by leaching processes. Subsurface soil COPCs may volatilize to soil gas and ultimately naturally biodegrade or disperse in the atmosphere. In addition, subsurface soil COPCs may migrate to groundwater and volatilize with dispersion in the atmosphere.

COPCs in the groundwater adjacent to the south segment of the East Ditch may migrate through groundwater advection. This can occur when the groundwater vertical gradient, such as the semi-confined groundwater pressure head observed in the UTU, provides a force greater than the gravity force of the LNAPL and capillary forces and if LNAPL is moving through media where the water is the wetting fluid. The transition of a localized section of the East Ditch from a disconnected stream consisting of overlying clays and silts with low effective porosities to overlying sediments with higher effective porosities resulted in movement of LNAPL and sheen-forming COPCs from the portion of the ditch with the least distance between the invert and the UTU into the surface water.

COPCs in the groundwater adjacent to the north segment of the East Ditch may migrate by advection and dispersion via groundwater flow, volatilize to soil gas and ultimately disperse into the atmosphere, or become adsorbed to aquifer soils. Advection by means of groundwater flow may redistribute COPCs to the shallow groundwater environment. These COPCs are subject to attenuation by chemical and biological degradation processes. The silt and sand in the UTU increases the probability of groundwater migration from the North Pit by groundwater to surface water discharge to the East Ditch.

Surface runoff (during Site operations) from contaminated surface soils could drain to the East Ditch. Discharge/runoff from the East Ditch was (and currently is) channeled to off-Site surface water and sediments. If COPCs accumulated within the ditch sediments, they may be released to

surface water and potentially transported to off-Site sediments. However, the potential for off-Site sediment transport could vary over time. Off-Site transport would be influenced by the amount of surface water runoff and the availability of sediment for transport, such as the amount of vegetative growth or maintenance in the East Ditch. For example, the amount of vegetative growth observed during the RI field activities would preclude substantive sediment transport. Trends in sediment concentrations may provide an indication of the potential for off-Site transport.

Potential secondary release mechanisms at the Site include:

- runoff from contaminated soils to surface water and sediment;
- soil leaching to groundwater;
- groundwater migration in the predominant direction of groundwater flow;
- potential groundwater migration to surface water adjacent to the South Pit along a limited portion of the East Ditch; and
- groundwater migration to surface water and sediments along the north segment of the East Ditch.

The mechanisms for releases from the sources, such as infiltration, percolation, advection and sorption, as discussed above, also apply to the secondary sources.

2.4.2 Generic Assessment Endpoints

The generic assessment endpoints are described in ERAGS Step 1 (USEPA, 1997) and are identified as:

- Adverse effects on ecological receptors, where receptors are plant and animal populations and communities, habitats, and sensitive environments.
 - Adverse effects on populations can be inferred from measures related to impaired reproduction, growth, and survival.
 - Adverse effects on communities can be inferred from changes in community structure or function.
 - Adverse effects on habitats can be inferred from changes in composition and characteristics that reduce the habitats' ability to support plant and animal populations and communities.

2.5 Screening-Level Ecological Effects Evaluation

The next step in the screening-level risk assessment is the preliminary ecological effects evaluation and the establishment of contaminant exposure levels that represent conservative thresholds for adverse ecological effects (USEPA, 1997). Conservative values for the screening-level ecological effects evaluation were compiled from the following sources (in order of preference):

- ***Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas*** (RG-263; TCEQ, 2017a) including ecological benchmarks updated January 2017 (TCEQ, 2017b);
- Ecological Soil Screening-Levels (SSLs) for plants, soil invertebrates, mammals and birds (USEPA, 2000);
- Oak Ridge National Laboratory (ORNL) screening values for plants and soil invertebrates (Efroymson, 1997a and 1997b);
- National Oceanic and Atmospheric Administrations (NOAA's) Screening Quick Reference Tables (SQuiRTs) (NOAA, 2008);
- EPA Region 5 Ecological Screening-Levels (USEPA, 2003);
- Hardness-based freshwater benchmarks calculated using Site-specific hardness and equations provided in the ecological benchmark spreadsheets (Table 16) (TCEQ, 2017b);
- Open literature review. For instance, a marine surface water screening value of 0.75 mg/L (geometric mean of five studies) was identified in the draft Aquatic Life Ambient Water Quality Criteria for Aluminum (EPA, 2017);
- If a screening value could not be identified for a pesticide, SVOC or VOC analyte and the analyte was detected in the medium, then a screening value for a surrogate chemical was chosen. The lowest no effects concentration for chemicals with similar structural, chemical, and physical properties to the analyte was chosen as the screening value. For example, benzene was chosen as the surrogate for the volatile aromatic compounds 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, isopropylbenzene, n-butylbenzene, and n-propylbenzene. While other VOCs such as ethylbenzene or the xylene isomers have closer structural, chemical, and physical properties to the volatile aromatic compounds, benzene has a lower screening value. Surrogates are listed in Tables 1 to 15. *Section 7.3.3 (Lack of Toxicity Data and Use of Surrogate Representatives)* provides further analysis of the use of surrogates.
- Bioaccumulative and detected analytes without screening values, are evaluated in this SLERA.
- Non-bioaccumulative and non-detected analytes without screening values were not further evaluated.

The results of the screening-level problem formulation and ecological effects evaluation are used to prepare the screening-level exposure estimates and risk characterizations for the North and South Pit area soils (Section 3) and for the surface water, sediment and groundwater to surface water pathway (Section 4).

3.0 SCREENING-LEVEL EXPOSURE ESTIMATE AND RISK CHARACTERIZATION – SOILS (STEP 2)

The screening-level exposure estimates and risk calculations are a simple ratio between the maximum concentrations from a data grouping to the media-specific screening-level. This section presents the screening-level exposure estimate and risk characterization for the North and South Pit area soils.

3.1 Screening-Level Exposure Estimate

To estimate exposures for the soils, the highest measured or estimated contaminant concentration for soils in the North and South Pits was used as the exposure concentration (as described in TCEQ Required Element 1). Ecotoxicity benchmark screening values (as discussed in Section 2.5 and listed on Tables 1 and 2) that are protective of communities in soil are compared directly against the maximum soil concentration.

3.2 Risk Estimate – South Pit Soils

Table 1 compares the detected and non-detected constituents in the South Pit area soils to screening values. Table 17 summarizes the screening assessment for the South Pit soils. Data were originally screened in Table 1 using the combined data set of 0 to 0.5-feet bgs and 1 to 2-feet bgs. Table 17 shows the number of exceedances by depth. COPCs were retained if they were detected and considered bioaccumulative (e.g., 4,4'-DDD) or if the COPC was detected with a maximum concentration exceeding the screening value. Metals, organochlorine pesticides, Total PCBs (Aroclor 1260 and Aroclor 1254 were the only Aroclors detected), 2,4-dimethylphenol, benzaldehyde, carbazole, dibenzofuran, high molecular weight polycyclic aromatic hydrocarbons (PAHs), and cyanide are COPCs retained for a Step 3a evaluation.

3.3 Risk Estimate – North Pit Soils

Table 2 compares the detected and non-detected constituents in the North Pit area soils to screening values. Table 18 summarizes the screening assessment for the North Pit soils. Data were originally screened in Table 2 using the combined data set of 0 to 0.5-feet bgs and 1 to 2-feet bgs. COPCs were retained if they were detected and considered bioaccumulative (e.g., 4,4'-DDD) or if the COPC was detected with a maximum concentration exceeding the screening value. Table 18 shows the number of exceedances by depth. Metals, organochlorine pesticides, Total PCBs (only Aroclor 1260 was detected), bis(2-ethylhexyl)phthalate, high molecular weight PAHs, pentachlorophenol, and cyanide are COPCs retained for a Step 3a evaluation.

3.4 Screening-Level Summary for Soils

The screening-level exposure estimate and risk characterization (Step 2) for the North and South Pit soils is complete. COPCs are retained for further evaluation in the Step 3a of the ecological risk assessment process (Section 6) if they were detected and considered bioaccumulative or if the COPC was detected with a maximum concentration exceeding the screening value.

4.0 SCREENING-LEVEL EXPOSURE ESTIMATE AND RISK CHARACTERIZATION – SURFACE WATER, SEDIMENT, AND RIPARIAN SOILS (STEP 2)

The screening-level exposure estimates and risk calculations are a simple ratio between the maximum concentrations from a data grouping to the media-specific screening-level. This section presents the screening-level exposure estimate and risk characterization for the East Ditch including the riparian soils along the south segment of the East Ditch.

To estimate exposures, the highest measured or estimated concentration for surface water, sediment, and riparian soils (south segment only) in the East Ditch was used as the exposure concentration (as described in TCEQ Required Element 1). The highest measured or estimated concentration for groundwater samples collected in 2014 or 2017 were used as the exposure concentrations to evaluate the groundwater to surface pathway for the East Ditch.

4.1 Risk Estimate – Freshwater (South Segment of the East Ditch)

Ecotoxicity benchmark screening values that are protective of communities in freshwater are compared directly against the maximum detected concentrations in surface water, sediment and riparian soil concentrations associated with the south segment of the East Ditch. Salinity measurements in this section of the ditch ranged from 0.273 to 0.486 ppt. The segment of the East Ditch south of the ‘S’ curve is classified as freshwater and is considered intermittently wet.

Between November and December 2017, a sediment cap was installed in the south segment of the East Ditch (Figure 5). This evaluation includes data from locations currently under the cap.

4.1.1 Surface Water

Table 3 compares the detected and non-detected constituents in the surface water for the south segment of the East Ditch to freshwater chronic screening values. Table 19 lists the COPCs detected at concentrations greater than the acute screening-levels or detected and considered bioaccumulative for the south segment of the East Ditch, respectively. In the south segment of the East Ditch, aluminum, five organochlorine pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, gamma-chlordane, and heptachlor), and Total PAHs are the COPCs retained for the Step 3a analysis based on comparison to chronic criteria as shown on Table 3. Only the aluminum concentration exceeds the acute criteria (Table 19).

4.1.2 Sediment

Table 5 compares the sediment data for the south segment of the East Ditch to screening values protective of benthic invertebrates. Table 20 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the south segment of the East Ditch. Barium, beryllium, selenium, thallium, vanadium, and cyanide are retained for evaluation in Step 3a because a screening level was not available. gamma-Chlordane is retained as a benthic COPC based on the comparison of the benchmark and the 95% UCL exposure point concentration.

4.1.3 Riparian Soils

Three locations were sampled along the riparian shelf for the south segment of the East Ditch (ESSS10 through ESSS12 and ESSB10 through ESSB12). Two surface soil samples (ESSS01 and ESSS02) were collected within the south segment of the East Ditch and are included in the riparian data set. These data were used to evaluate the potential ecological exposure as soils for the transitional riparian area. Table 6 compares the riparian soil data for the south segment of the East Ditch to screening values. Table 21 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the riparian soils. Barium, chromium, cyanide, selenium, and vanadium are retained as community COPCs in the 0 to 0.5-foot soil interval.

4.1.4 Sediment as Soil

Because the south segment of the East Ditch is intermittently wet, Table 7 compares the sediment data to soil screening values. Table 22 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the south segment of the East Ditch. Barium, chromium, manganese, mercury, selenium, vanadium, zinc, 4,4'-DDT, beta-BHC, and high molecular weight PAHs are retained as community COPCs for the Step 3a evaluation.

4.2 Risk Estimate – Marine (North Segment of the East Ditch)

Ecotoxicity benchmark screening values that are protective of communities in marine environments were compared directly to the maximum detected concentrations in surface water and sediment in the north segment of the East Ditch. Samples were collected in the East Ditch north of the ‘S’ curve up to Up River Road. This segment of the East Ditch is classified as marine based on salinity (up to 15.6 ppt).

4.2.1 Surface Water

Table 4 compares the detected and non-detected constituents in the north segment of the East Ditch surface water to marine chronic screening values. Table 23 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the north segment of the East Ditch. Only chronic screening values are used for this segment of the East Ditch. Aluminum, cobalt, manganese, 4,4'-DDT, alpha-chlordane, beta-BHC, endrin aldehyde, heptachlor, heptachlor epoxide, and methoxychlor are retained as community COPCs.

4.2.2 Sediment

Table 8 compares the detected and non-detected constituents in the north segment of the East Ditch sediment to screening values. Table 24 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the north segment of the East Ditch. Barium, heptachlor, and PAHs are retained as benthic COPCs based on the comparison of the benchmark and the 95% UCL exposure point concentration. Beryllium, thallium, endosulfan

sulfate, and cyanide are retained since a screening level was not available for the Step 3a evaluation.

4.3 Risk Estimate – Groundwater to Surface Water

Ecotoxicity benchmark screening values that are protective of communities in freshwater and marine water are compared directly to the maximum detected concentrations in groundwater potentially discharging to the south segment of the East Ditch. Consideration of groundwater as a source medium for ecological exposure pathways requires a groundwater assessment, including the delineation of relevant dissolved COPC plumes. The groundwater to surface water pathways are evaluated using data from the permanent monitoring wells installed along the south segment of the East Ditch (MWGW02) and the north segment of the East Ditch (MWGW04, MWGW05, MWGW15, and MWGW16) (Figure 5). As stated in the TCEQ guidance, *Determining Representative Concentrations of Chemicals of Concern for Ecological Receptors*, (TCEQ, 2013): “... the current groundwater data should be used for calculation of the EPC [exposure point concentrations] and for the purposes of evaluating compliance with any groundwater PCLs [protective concentration levels] protective of ecological exposures pathways.”

4.3.1 South Segment of East Ditch

Table 9 compares the detected and non-detected constituents in the groundwater data to freshwater chronic screening values. Since this segment of the ditch is intermittent, Table 25 lists the analytes detected at concentrations greater than the freshwater acute screening-levels or detected and considered bioaccumulative for the groundwater samples. The community level COPCs include copper, dieldrin, gamma-BHC, heptachlor, 1-methylnaphthalene, 2,4-dimethylphenol, benzo(a)pyrene, phenanthrene and cyanide. Selenium and mercury are retained because they are bioaccumulative. Total PAHs are retained because no screening benchmark is available.

4.3.2 North Segment of the East Ditch

Table 10 compares the detected and non-detected constituents in the groundwater data to marine screening values. Table 26 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the groundwater samples.

Representative Groundwater Concentrations

The discharge-weighted representative groundwater concentrations for the evaluation of the groundwater-to-surface water (^{SW}GW) pathway were calculated using the TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012) spreadsheet as described in Determining Representative Concentrations of Chemicals of Concern for Ecological Receptors (TCEQ, 2013). Appendix C contains the discharge-weighted representative concentration calculations for the COPCs retained after the screening assessment. The sources of the input parameters are listed below and discussed in more detail in this RI Report (Volume I).

Parameter	Value	Source
Hydraulic conductivity (K) (cm/sec)	6.01E-03	K for MWGW04 and MWGW05
Hydraulic gradient (i) (ft/ft)	0.0021	Gradient from MWGW06 to MWGW16 (May 2016)
Effective porosity (θ_E)	0.29	Porosity of sand measure from MWGW15
Aquifer saturated thickness discharging to surface water (δ_p)	3.50	Thickness of sand unit discharging to East Ditch at NPSB06/EDNSD07

Representative concentrations were compared to the surface water marine chronic criteria (Table 26). Cobalt, manganese, 4,4'-DDT, endosulfan I, endosulfan sulfate, gamma-chlordane, heptachlor, and heptachlor epoxide representative concentrations exceed the surface water marine chronic criteria.

Tier 1 Dilution Factor

Since COPC concentrations at the groundwater to surface water point of exposure wells exceed the surface water marine chronic criteria, the criteria were adjusted by the Tier 1 dilution factor of 0.15 (TCEQ, 2007b). None of the COPCs are listed on the 303(d) list as impairing segment 2484, which is the nearest classified segment downstream of the Site (TCEQ, 2015). The groundwater in this portion of the Site is discharging to a flowing body of water, the perennial portion of the East Ditch.

The north segment of the East Ditch has volumetric contributions from groundwater, surface water and tidal influences from the Corpus Christi Inner Harbor. If base flow information is not available to estimate the seven-day, two-year low-flow, then a value of 0.1 cubic feet per second (ft^3/s) is usually assumed for perennial streams (TCEQ, 2012). Base flow information is not available for the East Ditch. The Tier 1 dilution factor can be justified by assuming the default seven-day, two-year low-flow of 0.1 ft^3/s as the surface water flow rate (Q_{sw}) and 3.68E-04 ft^3/s from the discharge weighted representative calculations as the groundwater flow rate (Q_{gw}). As shown on Table 26, the representative concentrations for cobalt, manganese, and 4,4'-DDT exceed the Tier 1 surface water criteria (^{SW}GW).

Tier 2 Dilution Factor

Site-specific information was used to derive a dilution factor to develop Tier 2 surface water criteria (^{SW}GW). As shown on the discharge-weighted representative concentration calculations, the Q_{gw} (groundwater PCLE zone to surface water discharge rate) is 3.68E-04 ft^3/s . The Q_{sw} is 0.1 ft^3/s (TCEQ, 2012). The site-specific dilution factor, denoted by $(Q_{\text{gw}}/(Q_{\text{gw}} + Q_{\text{sw}}))$, is 3.67E-03. As shown on Table 26, all representative concentrations are below their respective Tier 2 surface water criteria (^{SW}GW).

4.4 Screening-Level Summary for Surface Water, Sediments, and Groundwater to Surface Water Pathway

The screening-level exposure estimate and risk characterization (Step 2) for the surface water and sediment in the East Ditch and the groundwater to surface pathway is complete. COPCs are retained for further evaluation in the Step 3a of the ecological risk assessment process (Section 6) if they were detected and considered bioaccumulative or if the COPC was detected with a maximum concentration exceeding the screening value.

5.0 SCREENING-LEVEL SCIENTIFIC MANAGEMENT DECISION POINT (STEP 2)

The SMDP is the point during the process when the risk assessor communicates results of the assessment to a risk manager. The risk manager determines whether the information is sufficient to arrive at a decision regarding risk management strategies and/or the need for additional information to characterize risk (USEPA, 1997). At the end of Step 2 and Required Element 4, the SMDP will be one of the following or a combination of the following:

1. There is adequate information to conclude that the ecological risks are negligible and therefore no need for remediation on the basis of ecological risk;
2. The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3; or
3. The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

SMDP 1 is recommended if non-bioaccumulative analyte concentrations are below the ecological screening values and no bioaccumulative analytes are detected (TCEQ Required Element 1).

SMDP 2 is recommended if a non-bioaccumulative analyte concentration exceeds the ecological screening values or if a bioaccumulative analyte is detected (TCEQ Required Element 1 and ERAGs Step 2). Additional data may not be necessary beyond what was collected in the RI, but a more complete evaluation may be necessary, especially for bioaccumulative COPCs. The assessment moves into USEPA Step 3a (TCEQ Required Elements 5 through 8).

SMDP 3 is recommended if the RI data indicates a potential for adverse ecological effects exists at the Site, and a more thorough assessment, such as a Baseline Ecological Risk Assessment is warranted. The assessment would move into ERAGS Step 3b (TCEQ Required Elements 5 through 8). If the analytical data shows that an ecologically relevant COPC (e.g., bioaccumulative and recalcitrant with potential significant health impacts) is being released to the environment, then the assessment would move directly into the next phase of the USEPA process (USEPA Steps 3b through 7) also known as a Tier 3 assessment under TCEQ. Additional data may include tissue analyses, toxicological testing, and/or additional media analyses.

5.1 SMDP - South Pit Soils and South Segment of the East Ditch

The recommended Step 2 SMDP for the South Pit soils and south segment of the East Ditch is:

The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3a. As discussed above, the COPCs are: 1) non-bioaccumulative and were detected above the conservative benchmark or 2) are considered bioaccumulative and were detected (TCEQ Required Element 1 and ERAGS Step 2).

The South Pit soil exposure area (6.9 acres) and the small riparian exposure area (0.49 acres) will be further evaluated using terrestrial receptors. The 0.6 acre south segment of the East Ditch will be evaluated as both a freshwater aquatic system and a terrestrial environment because it is an intermittent stream.

5.2 SMDP - North Pit Soils and North Segment of the East Ditch

The recommended Step 2 SMDP for the North Pit soils and north segment of the East Ditch is:

The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3a. As discussed above, the COPCs are: 1) non-bioaccumulative and were detected above the benchmark or 2) are considered bioaccumulative and were detected (TCEQ Required Element 1 and ERAGS Step 2).

The North Pit soil exposure area (4.7 acres) will be evaluated further using terrestrial receptors. The 2.2 acre north segment of the East Ditch will be evaluated as a saltwater aquatic system.

6.0 TROPHIC LEVEL ANALYSIS (STEP 3A)

Step 3a refines the Step 2 exposure estimates and risk characterization, as it is focused toward non-bioaccumulative COPCs detected above the screening values and detected bioaccumulative COPCs. Step 3a assumptions are refined from conservative estimates of exposure and toxicological impacts (i.e., maximum concentrations compared to media-based screening values) to site-specific and receptor-specific estimates of exposures and trophic-based ecotoxicity screening values (USEPA, 2001). In Step 3a, risks are calculated using a trophic model (Sample et.al., 1998a, 1998b) and exposure assumptions in an iterative process that determines the constituents, media and pathways that are of primary concern at the site. The TCEQ Required Elements 5 through 7 describe this iterative process:

- Required Element 5 - Preparation of conservative exposure assumptions, intake equations that account for total exposure, NOAEL and LOAEL values;
- Required Element 6 - Utilize an ecological HQ methodology to compare exposures to the NOAELs in order to eliminate COPCs that pose no unacceptable risk (i.e., NOAEL hazard quotient less than or equal to 1); and
- Required Element 7 - Justify the use of less-conservative assumptions (e.g., a larger home range) to adjust the exposure and repeat the HQ exercise in Required Element 6 eliminating COPCs that pose no unacceptable risk based on comparisons to the NOAELs and LOAELs.

6.1 Refined Problem Formulation

The outcome of Steps 1 and 2 (Sections 3 and 4) dictates which COPCs identified at the Site can be eliminated from further consideration and which should be evaluated further in Step 3a. Because of the conservative assumptions used during USEPA Steps 1 and 2, some of the COPCs retained for Step 3a might pose negligible risk (USEPA, 1997). Prior to elimination of pathways or COPCs, USEPA Step 3a/TCEQ Required Elements 5 through 7 were completed.

6.1.1 South Pit Soils and South Segment of the East Ditch – Refined Problem Formulation and Summary of COPCs

During the 2010 to 2014 site observations, the southern segment of the East Ditch (750 linear feet) ephemeral, only accumulating water after rain events. As discussed in the RI/FS Work Plan (URS, 2010) and this RI Report (Volume I), the course of the East Ditch has evolved and matured over time from a small drainage swale to a more engineered drainage channel. The drainage channel was engineered by TxDOT to provide surface water runoff for IH-37. Since the ditch does not retain water, it does not support a freshwater ecosystem (Photos 6 to 8 in Appendix A-2), and is considered intermittent. During initial (2010 - 2014) field activities, surface water was not observed in the south segment of the East Ditch while surface water remained in the north segment, north of the concrete lined ‘S’ curve. During the 2017 Site visits, the south segment of the East Ditch was observed to have transitioned from an ephemeral drainage ditch to an intermittent

stream. Surface water gauging measurements conducted from March to November 2017 indicate that the ditch returns to the dry conditions in between rainfall events and surface water drainage. COPCs identified in the groundwater to surface water pathway were evaluated using the groundwater data compared to freshwater acute surface water criteria.

Following the screening assessment, there are COPCs in the South Pit soils, riparian soils along the south segment of the East Ditch, and in the sediments from the ditch. These sediments were evaluated as both freshwater sediment and soil. There are also COPCs in the surface water and the groundwater that may potentially discharge to the south segment of the East Ditch. The south segment of the East Ditch was evaluated in Steps 1 and 2 as both a freshwater aquatic system and a terrestrial system and because of its transitional nature, it is evaluated as both aquatic and terrestrial in the Step 3a.

6.1.2 North Pit Soils and North Segment of the East Ditch – Refined Problem Formulation and Summary of COPCs

COPCs from the terrestrial soils associated with the North Pit are evaluated in the Step 3a. The sediment and surface water COPCs from the north segment of the East Ditch are evaluated as marine habitat in the Step 3a. This assessment also includes the evaluation of the groundwater to surface water pathway because the hydrogeological model discussed in Volume I of this RI Report shows a complete pathway in this segment of the East Ditch. COPCs identified in the groundwater to surface water pathway were evaluated using the groundwater data compared to marine chronic surface water criteria.

6.2 Site-Specific Assessment Endpoints

The assessment endpoint identified in ERAGS Step 1: "...adverse effects on ecological receptors, where receptors are plant and animal populations and communities, habitats, and sensitive environments" is carried forward to Step 3a, but refined and expanded for each feeding guild (and community where appropriate) within each trophic level of the habitat specific food webs (USEPA, 1997). Selection of assessment endpoints represents a significant decision point in the ecological risk assessment process (TCEQ, 2017a). Table 27 is a compilation of critical ecological attributes and assessment endpoints modified from TCEQ (2017a) for feeding guilds and communities at the Site.

6.3 Exposure Assessment

The exposure assessment phase expands the problem formulation and defines quantitative inputs for the exposures. These inputs include:

- A listing of the representative wildlife receptors with accompanying exposure parameters such as body weight, ingestion rates, and portions of dietary exposure;

- Methods used to estimate the trophic exposure point concentrations including both direct and indirect exposures for food web modeling (e.g., bio-uptake factors from soil to plants or soil to invertebrate); and
- Criteria used to determine toxicity reference values (TRVs) including application of uncertainty factors.

6.3.1 Wildlife Receptors

The following species are used for food web modeling for both the conservative and less-conservative evaluations:

- Terrestrial System
 - Herbivorous mammals – Eastern cottontail, Texas pocket gopher (1 to 2-foot zone only)
 - Omnivorous mammal – White-footed mouse, nine-banded armadillo (0 to 0.5-foot soil zone for food web analysis and 1 to 2-foot soil zone for incidental ingestion)
 - Carnivorous mammal – Coyote
 - Herbivorous Bird – Mourning dove
 - Omnivorous Bird - American robin
 - Carnivorous Bird – Red-tailed hawk
 - Reptiles – Texas indigo snake, listed as a Texas threatened species
- Aquatic System (East Ditch)
 - Omnivorous mammals – Raccoon
 - Carnivorous Bird – Snowy egret; the snowy egret is a surrogate for the wood stork, reddish egret and white-faced ibis – listed as Texas threatened species

These species are both known to be susceptible to food web exposures or are representative prey of organisms that are susceptible to food web exposures (USEPA, 1993). They reflect a range of trophic levels (e.g., large carnivorous mammal as compared to a small omnivorous mammal) and thus dietary exposure. Furthermore, dietary and toxicological information is available for these species, making them good candidate species for food web modeling (USEPA, 1993; Sample et al., 1996). As such, the selected species can be used as surrogates to represent the types of exposures and potential impacts that could occur to other wildlife at the Site. These animals are also commonly found in the vicinity of the Site.

Mourning Dove – The mourning dove (*Zenaida macroura*) was selected to represent an herbivorous bird in the terrestrial food web. The dove plays an important role in a terrestrial ecosystem because it distributes seeds for many grasses and forbs. The dove is also an important

prey for many high trophic level carnivores, such as the red-tailed hawk and the coyote. The dove primarily feeds on seeds, which makes up approximately 99% of its diet; however, the dove also tends to consume grit and soil on bare patches of ground. This habit is reflected in the dove's soil ingestion rate of 16% of its food ingestion rate and is the highest soil ingestion rate of any of the receptors evaluated. The mourning dove is also an important game species that is widely distributed throughout the United States (USEPA, 1993).

American Robin – The American robin (*Turdus migratorius*) was selected to represent an omnivorous bird in the terrestrial food web. The diet of the robin consists of invertebrates, such as earthworms and snails, and seeds and fruit. Robins can be found in habitats such as forests, wetlands, swamps, and habitat edge zones where forested areas are broken up by range and pastureland as well as urban settings. The robin plays an important role in the ecosystem because it distributes seeds for many fruit species. It nests in shrubs and trees (USEPA, 1993; NGS, 1987).

Red-Tailed Hawk – The red-tailed hawk (*Buteo jamaicensis*) serves as a high trophic level predator in the terrestrial food web. It is a top carnivore in the ecosystem, preying on small mammals, birds, and large insects. It controls the populations of many of the lower trophic level prey species. The red-tailed hawk is widely distributed throughout the United States with home ranges reaching upwards of 1,500 hectares. Their habitats range from forests to prairie and can include urban areas (USEPA, 1993; NGS, 1987).

Red-Winged Blackbird – The red-winged blackbird (*Agelaius phoeniceus*) lives in marshes and sloughs or where bushes and small trees grow in and around ponds, lakes, and sluggish streams. They feed in open fields with flocks of cowbirds, starlings, and grackles on weed seeds and waste grain, but they also feed on mayflies, caddis flies, moths, beetles, caterpillars, grubs, grasshoppers, spiders, myriapods, mollusks, and snails. Vegetable matter makes up about 73% of their diet and animal matter makes up the remaining 27%. They nest in cattails, rushes, bushes, and trees found near water (Terres, 1980). Nests are placed in limbs over water in response to predation pressure (Yasukawa and Searcy, 1995).

Snowy Egret – The snowy egret (*Egretta thula*) is a medium-sized heron (51 to 69 centimeters) that shuffles its feet to stir up benthic aquatic prey. It is found mostly in freshwater and saltwater marshes but also sometimes follows cattle and other livestock as does the cattle egret (USEPA, 1993). The snowy egret eats small fishes, frogs, lizards, snakes, shrimps, fiddler crabs, crayfishes, grasshoppers, cutworms, and aquatic insects (Terres, 1980). A home range for the snowy egret was not located in the scientific literature. Studies have documented average round trip distances to feeding sites ranging from 11 to 16 kilometers (km) for the great egret (*Ardea alba*) (Brzorad et.al., 2015). The mean foraging distance for the great blue heron is 7 to 8 km with a maximum range of 15 to 20 km with a feeding territory of 8.4 hectares (21 acres) (with a standard deviation of 5.4 hectares) (EPA, 1993). Based on the similarity in feeding habits and foraging distances, the feeding territory of the great blue heron is used as a surrogate home range for the snowy egret.

Eastern Cottontail – The eastern cottontail (*Sylvilagus floridanus*) is the most widely distributed of the medium-sized rabbits and is found throughout Texas (Davis and Schmidly, 1994). It feeds on green vegetation in the summer and bark and twigs in winter. The cottontail is active from early evening to late morning and is preyed on by owls, hawks, and carnivorous mammals. It represents herbivorous mammals in both the freshwater/drainage ditch and terrestrial food web. The cottontail occupies a large variety of habitats, including glades and woodlands, deserts, swamps, prairies, hardwood forests, rain forests, and boreal forests (USEPA, 1993). It commonly frequents brush-dotted pastures, the brushy edges of cultivated fields, and well-drained stream sides (Davis and Schmidly, 1994). It does not hibernate and is active all year, showing peaks of daily activity at dawn and dusk (USEPA, 1993).

White-Footed Mouse – The white-footed mouse (*Peromyscus leucopus*) was selected to represent an omnivorous mammal in the terrestrial food web. The maximum home range of adult males is about 0.2 hectares, that of the female about 0.15 hectares (Davis and Schmidly, 1994). The white-footed mouse disperses seeds for many plants and provides an important prey item for many high trophic level predators, such as snakes, coyotes, and birds of prey. The white-footed mouse feeds mainly upon seeds, fruits, and insects. The white-footed mouse prefers wooded or brushy areas (USEPA, 1993; Burt, 1976).

Raccoon – The raccoon (*Procyon lotor*) is a medium-sized, omnivorous mammal known to be relatively abundant and common in local habitats of interest. The physiology and bioenergetics are of the raccoon are relatively well studied (USEPA, 1993). It was selected to represent a littoral-zone/shoreline gleaning omnivore. Although highly opportunistic in their foraging behavior, and likely to obtain much of their food (especially plant material) in terrestrial areas, raccoons tend to focus most of their feeding effort on aquatic organisms when there is ready access to water bodies. The only other medium-sized omnivorous mammal that sometimes preys or forages on aquatic organisms is the opossum (*Didelphis virginiana*) which, compared to the raccoon, is much less water-dependent.

Least Shrew – The least shrew (*Cryptotis parva*) is one of the smallest mammals, growing only up to three inches long and weighing approximately 4 to 7 grams. It is a regular inhabitant of habitats transitioning from fields to forests. It frequents weedy and brushy fields and hedgerows that occur in damp woods or damp meadows. They eat dead animals, insects, millipedes, insect larvae, spiders, snails, and worms as well as a small amount of vegetable matter (Gottschang, 1981). A least shrew may eat more than their own body weight in food each day (Burt, 1976). They dig through loose soil and leaf litter for prey. When attacking larger animals such as a frog or praying mantis, the least shrew will bite the legs, crippling its prey. Their saliva is venomous and will cause swelling and pain to a human. Lizards, which are usually too large for the shrew, get bitten on the tail, which comes off. The lizard escapes and the shrew eats the tail. Least shrews will invade beehives and eat all the larvae and then proceed to live in the hive. They are social

animals and often share nests. Predators of the least shrew include owls, hawks, raccoon, skunk, and snakes (Northern Virginia Ecology On-line, 2003).

Coyote – The coyote (*Canis latrans*) represents the top mammalian carnivore in the food webs. Often called the “prairie wolf”, the extensive habitat range of the coyote includes desert scrub through grasslands into the timbered sections of the West. They have been noted in Nueces County. The food habits of coyotes are varied. They are opportunistic and make use of anything that can be eaten – garbage, carrion, fresh meat in the form of wild and domestic animals, insects, frogs, snakes, fruits, melons and so forth. Their natural food consists largely of rabbits, rodents and carrion. Charles Sperry analyzed 8,339 stomachs of coyotes from the western United States with the following results: rabbits 33%, carrion 25%, rodents 18%, domestic livestock 13.5%, deer 3.5%, birds 3%, insects 1%, other (skunks, weasels, shrews, moles, snakes, and lizards) 1%, and vegetable matter 2%. In terms of economic importance, the coyote is the second most important furbearing animal in the state, exceeded only by the raccoon (Davis and Schmidly, 1994).

Texas Pocket Gopher – The Texas pocket gopher (*Geomys personatus*) is found in south Texas and prefers deep sandy soil where the sand is moist enough to permit packing. Depending on the soil type, numerous burrows of these gophers can occur in a small area. Their food consists largely of vegetation and most of the foraging is underground; plants are seized from below and pulled into the burrow (Davis and Schmidly, 1994). The Texas pocket gopher represents mammalian herbivores exposed to subsurface soil in the terrestrial food web.

Nine-Banded Armadillo – The nine-banded armadillo (*Dasypus novemcinctus*) is about the size of a terrier dog. Adult males weigh between 5 and 8 kilograms and adult females weigh between 4 and 6 kilograms. The armadillo occurs throughout the state, except in the western Trans-Pecos. Armadillos are fond of water and prefer small streams and water holes. The armadillo digs cone-shaped pits about 3 to 4 inches deep, laps up any exposed insects before moving on, then revisits the pits regularly to claim any insects that may have been trapped. In addition to digging for food, an armadillo claws are used to dig burrows. One armadillo may have as many as fifteen burrows located in its 10 acre range – some in use and some abandoned. Soil texture exerts a definite influence on the density of armadillos in an area. The most important factor contributing to the distribution of armadillos is the hardness of the soil during the dry season, because the food of the animal is obtained largely by probing for insects and other forms of animal life in the ground. The armadillo consumes mostly insects and invertebrates, but will consume reptiles, amphibians, bird eggs, plants, berries, fungi and carrion when it is available (Davis and Schmidly, 1994). The armadillo represents mammalian omnivores exposed to surface and subsurface soil in the terrestrial food web via exposure to surface soil from feeding and subsurface soil for incidental ingestion of soil.

Texas Indigo Snake – The Texas indigo snake (*Drymarchon corais erebennus*) is evaluated quantitatively in the SLERA Step 3a trophic assessment as a special status species, but also as representative of reptiles that may utilize the site. It has a large home range, up to 229 acres in the

summer, and ingests a wide variety of foods including small mammals, frogs, toads, lizards, baby turtles, birds and other snakes. Indigo snakes will attack and consume rattlesnakes. It lives in honey mesquite brush near streams, ponds and seeps. The snake roams over large areas during the day when foraging and is active during every month of the year, only retreating to its burrow during cold or severely dry weather (Werler and Dixon, 2000). The Texas indigo snake can grow as long as 125 inches (262 centimeters) (Snyder, 1993).

6.3.2 Wildlife Exposure Factors

The food and water ingestion rates, body weight and soil/sediment ingestion rates used for each endpoint are presented in Table 28. The food and water ingestion rates are conservative estimates derived from the literature or are derived using allometric equations taken from the USEPA *Wildlife Exposure Factors Handbook* (USEPA, 1993) and body weights. The allometric equations calculate food ingestion rates in dry weight.

Wildlife may ingest substantial amounts of soil while feeding, either deliberately or inadvertently. Concentrations of some elements and environmental contaminants in ingested soil may be so high in comparison with the concentrations in the animal's diet that the soil becomes an important means of exposure. Estimates of soil ingestion rates are required for risk assessments that attempt to include all sources of exposure to environmental contaminants. Soil ingestion also may be important to animals by supplying nutrients or by interfering with absorption of nutrients (Beyer et al., 1994). In contrast to food and water consumption rates, generalized models do not exist with which to estimate incidental soil or sediment ingestion rate by wildlife. Soil or sediment ingestion rates for the SLERA are taken from literature sources such as Beyer et al. (1994) and are listed in Table 28. For purposes of estimating the cumulative dose, the percent soil or sediment ingestion will be in addition to, rather than a portion of, the food ingestion rate. Soil ingestion rates are consistent with those used in the PCL Database.

Table 29 presents the dietary information for the endpoint species. The dietary breakdown consists of terrestrial plants, terrestrial invertebrates, terrestrial mammals, terrestrial birds, aquatic vascular plants, aquatic insects, aquatic invertebrates, amphibians, and fish for each endpoint.

6.3.3 Food Web Ingestion Modeling

Food web ingestion-based modeling calculations are performed to characterize potential exposures to contaminants via the food web and to identify potential adverse effects for mammals and birds. Ingestion modeling is based on species-specific exposure parameters and ingestion intake requirements based on standard allometric equations (USEPA, 1993).

The following general equation (TCEQ, 2017a) is used to estimate oral exposure for wildlife receptors:

$$\text{Dose (mg/kg-day)} = \frac{\left((IR_{\text{food}} \times C_{\text{food}}) + (IR_{\text{water}} \times C_{\text{water}}) + (IR_{\text{soil}} \times C_{\text{soil}}) + (IR_{\text{sed}} \times C_{\text{sed}}) \right) EMF}{BW}$$

where:

- Dose = Estimated dose from ingestion (mg COPC/kg body weight/day)
- IR_{food} = Ingestion rate of food (prey) (kg/day)
- C_{food} = COPC concentration in food (milligrams per kilogram [mg/kg])
- IR_{water} = Ingestion rate of water (L/day)
- C_{water} = COPC concentration in water (mg/L)
- IR_{soil} = Ingestion rate of soil (kg/day)
- C_{soil} = COPC concentration in soil (mg/kg)
- IR_{sed} = Ingestion rate of sediment (kg/day)
- C_{sed} = COPC concentration in sediment (mg/kg)
- EMF = Exposure modifying factor (unitless)
- BW = Body weight of the receptor (kg)

The purpose of food web modeling is to characterize potential exposures to COPCs via the food web and to identify potential adverse effects for mammals and birds. Through food web modeling, COPCs will either be retained for or eliminated from further steps of the ecological risk assessment. As stated above, the food web modeling occurs in two phases per TCEQ Required Elements 6 and 7: a conservative NOAEL based model followed by a less-conservative NOAEL and LOAEL based model. The conservative NOAEL based model starts from an initial set of conservative assumptions such as 100% bioavailability and a site foraging factor of 1 (i.e., the receptor lives 100% of the time on the Site). The NOAEL based model will be used to identify chemicals that require further consideration. The food web model is refined in the less-conservative phase of the ecological risk assessment to include a LOAEL based assessment, modified exposure point concentrations, and receptor-specific / Site-specific exposure modifying factors.

COPC Uptake into Food Items

Chemicals in tissues of organisms of the food web are likely to be ingested by the species that feed on them (i.e., those occupying higher trophic levels); the result may be the expression of toxicological effects by the higher trophic level species. Bioaccumulation differs from bioconcentration on the basis of the mechanism of chemical uptake, although distinguishing between the two is sometimes highly artificial (Streit, 1992). Chemical specific uptake factors are used whenever possible, but if a chemical specific factor was not available, a surrogate uptake factor, an uptake factor equation, or a default uptake factor of 1 was used. Table D-1 in Appendix D shows the uptake factors used in the SLERA and their sources. The 2017 PCL Database is the primary source for the uptake factors. These values have been peer reviewed and are all adjusted

to dry weight. If the PCL Database did not include a COPC, then alternate sources were found and are listed in Appendix D.

Selection of Toxicity Reference Values

Mammal and bird TRVs were developed through a three-step process: 1) literature search; 2) selection of a TRV; and 3) adjustment of the selected TRV for the receptor. Each COPC has a TRV based on a LOAEL and on a NOAEL. The literature search covered several ecotoxicological databases in addition to scientific literature. The compiled results of this literature search are summarized for each COPC and presented in Appendix D (Tables D-2 and D-3). The rationale for selection of a TRV for each ecological COPC was based on several key factors:

- Preference for chronic (i.e., long-term) endpoints, especially those that include critical life stages (see below for more information);
- Preference for the use of the ecological receptor as a test organism;
- Preference for the highest NOAEL that did not exceed the lowest LOAEL;
- Preference for food studies over gavage or oral intubation studies; and
- Preference for ecologically significant effects, such as survival, growth, and/or reproduction.

The term “ecologically significant” is subjective. Toxicity data was chosen by weighing multiple factors including species used in study, life stage, chemical form of the contaminant, route of exposure, length of study, and other measured endpoints. The relevant information about the available toxicity studies was evaluated and assessed for a constituent when choosing the toxicity data to be used in the Step 3a evaluation.

The exposure duration in each study was identified in Table D-3 when provided. Typically, chronic exposures should be more protective, thus are more relevant. However, given the differences in species response, methods, observed effects, dispersal characteristics, and habitat use in the field, all potential toxicological endpoints and exposure periods were considered. The following guidelines were used to determine the exposure duration of a toxicity study:

- Chronic exposures are considered to be those equal to or greater than 10% of the life span of the test organism. An exception to this criterion is when exposure occurs during a sensitive life stage such as gestation.
- Sub-chronic exposures are considered to be those repetitive exposures less than 10% of the life span of the test organism, yet greater than 14 days for an ingestion study.
- Acute exposures are considered to be those of a single exposure or repetitive exposures up to 14 days or 10% of the life span of the test organism (USACHPPM, 2000).

Once the TRV for an ecological COPC was selected, it was adjusted for the ecological receptor by incorporating exposure duration uncertainty factors. TRVs were not extrapolated across taxonomic classes because physiological differences between taxonomic classes are assumed to be too great to make any extrapolation useful in predicting effects to another taxonomic class of animals (e.g., using mammal data for birds or bird data for amphibians) (USACHPPM, 2000). The evaluation of the Texas indigo snake is an exception to this practice. Reptilian toxicity data is sparse and therefore avian toxicity data was used with an uncertainty factor of 10 applied. TRVs are available for reptiles for lead and are described in the PCL Database.

The uncertainty factors in Table 30 were used to account for differences in exposure duration and endpoints (modified from USACHPPM, 2000). Uncertainty factor adjustments for LOAELs to NOAELs, acute to chronic duration, or sub-chronic to chronic duration will follow the USACHPPM (2000) guidelines. As is true with any adjustment of this type, there is uncertainty in applying these broad factors. However, adjusting available TRVs with appropriate uncertainty factor is standard practice in ecological risk assessments and relies on the best available and current toxicological information.

6.4 Risk Characterization

Predictions of the likelihood for adverse effects, if any, for the food web modeling studies are based on HQs (USEPA, 1997). The HQs were calculated by dividing the estimated ingestion intakes by the reference toxicity values for each of the COPCs for each of the species.

NOAEL – HQ = Exposure Dose/ NOAEL-TRV and

LOAEL – HQ = Exposure Dose/LOAEL-TRV

where:

- Exposure Dose = estimated constituent intake for the site or area (mg COPC/kg body weight per day)
- NOAEL-TRV = toxicity reference dose based on a NOAEL (mg COPC/kg body weight per day)
- LOAEL – TRV = toxicity reference dose based on a LOAEL (mg COPC/kg body weight per day)

The HQ value of 1 was considered the threshold for indicating that adverse effects may occur. An HQ less than a value of 1 (to one significant figure) indicates that adverse impacts to wildlife are considered unlikely (USEPA, 1997). An HQ of 1 or greater is an indication that further evaluation may be necessary to evaluate the potential for adverse impacts to wildlife. HQs equal to 1 using TRVs that are based on NOAELs should be considered protective. However, HQs equal to 1 using TRVs that represent LOAELs may indicate a potential for low effects. The LOAEL-based TRV is only applicable to the less-conservative assessment presented in Section 6.6.

6.5 Conservative Analysis

HQs were calculated using NOAEL-based TRVs, assumptions of 100% bioavailability, and with no exposure modifying factors (TCEQ Required Element 6). Those COPCs with HQs less than 1 in the conservative analysis were not carried forward to the less-conservative analysis.

6.5.1 South Pit Terrestrial-Conservative Analysis

Plants and Invertebrates – The terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. Table 17 shows the maximum detected values for each COPC compared with the lowest of the available screening level for the two different soil depths evaluated. If only plant screening values and soil invertebrate values are considered for the 0 to 0.5-foot soil interval, then the following are soil community COPCs: barium, chromium, copper, lead, manganese, selenium, vanadium, zinc, mercury, beta-BHC, and gamma-BHC. There are no community screening values for 4,4'-DDT, dieldrin, endrin, endrin aldehyde, or cyanide.

Upper Trophic Level Receptors - Table 31 summarizes the NOAEL-based HQs for the South Pit terrestrial assessment. Appendix E-1 shows the individual calculations. This phase of the SLERA uses the maximum detected concentration as the exposure point concentrations and no modifying factors (such as area use factor) are applied to the exposure. If the NOAEL-based HQs are below 1 for a COPC that COPC is removed from further evaluation in the less-conservative analysis. Table 31 provides an explanation for retaining or eliminating COPCs for the less-conservative analysis.

The following COPCs are retained for further evaluation in South Pit soils: barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, 4,4'-DDT and high molecular weight PAHs.

6.5.2 North Pit Terrestrial-Conservative Analysis

Plants and Invertebrates – The terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. Table 18 shows the maximum detected values for each COPC compared with the lowest of the available screening level for the two different soil depths evaluated. If only plant screening values and soil invertebrate values and the 0 to 0.5-foot soil interval are considered, then the following are considered soil community COPCs: aldrin, barium, chromium, lead, manganese, mercury, selenium, vanadium, and zinc. There are no community screening values for endrin, endrin aldehyde, bis(2-ethylhexyl) phthalate, high molecular weight PAHs, or cyanide.

Upper Trophic Level Receptors - Table 32 summarizes the NOAEL-based HQs for the North Pit terrestrial assessment. Appendix E-1 shows the individual calculations. As discussed for the South Pit soils, this phase of the SLERA uses the maximum detected concentration as the exposure point concentrations and no modifying factors (such as area use factor) are applied to the exposure. If the NOAEL-based HQs are below 1 for a COPC that COPC is removed from further evaluation.

Table 32 provides an explanation for retaining or eliminating COPCs for the less-conservative analysis.

The following COPCs are retained for further evaluation in North Pit soils: barium, cadmium, chromium, copper, lead, nickel, mercury, selenium, zinc, cyanide, bis(2-ethylhexyl)phthalate, and high molecular weight PAHs.

6.5.3 East Ditch Riparian Soil (South) – Conservative Analysis

Plants and Invertebrates - The terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. Table 21 shows the maximum detected values for each COPC compared with the lowest of the available screening level. If only plant screening values and soil invertebrate values and the 0 to 0.5-foot soil interval are considered, then the following are considered soil community COPCs: barium, chromium, vanadium, and selenium. There are no community screening values for cyanide.

Upper Trophic Level Receptors - The transitional area between the terrestrial uplands and the south segment of the East Ditch was sampled to assess the overland flow pathway from the terrestrial area to the ditch. Eight soil samples were taken in the riparian zone and the maximum detected concentrations were used as the exposure point concentrations in the terrestrial model. Table 33 shows the NOAEL-based assessment for the riparian soils. Table 33 provides an explanation for retaining or eliminating COPCs for the less-conservative analysis. Only barium and selenium show NOAEL-based HQs slightly above 1. The least shrew has a NOAEL-HQ of 1.2 for selenium and the Texas indigo snake has NOAEL-HQs for selenium and barium of 3.2 and 2.7, respectively. An evaluation of the risk assessment for reptiles is presented in the uncertainty section.

6.5.4 East Ditch Sediment (South) as Soil - Conservative Analysis

Plants and Invertebrates – The terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. Table 22 shows the maximum detected values for each COPC compared with the lowest of the available screening level. If only plant screening values and soil invertebrate values are considered, then the following are considered soil community COPCs: barium, beta-BHC, chromium, manganese, mercury, selenium, vanadium and zinc. There are no community screening values for 4,4'-DDT or high molecular weight PAHs.

Upper Trophic Level Receptors - As described in Section 6.1.2 (Refined Problem Formulation), the freshwater (south) segment of the East Ditch appears to have transitioned from the ephemeral drainage ditch observed during the 2010-2014 RI to the intermittent stream observed in 2017. Surface water gauging measurements conducted from March to November 2017 indicate that the ditch returns to the dry conditions in between rainfall events. Because of site conditions, the East Ditch sediment samples taken from the south segment are assessed as soil. Table 34 shows a summary of the NOAEL-based HQs for the terrestrial receptors. Table 34 provides an explanation for retaining or eliminating COPCs for the less-conservative analysis. Note that the Texas pocket

gopher is not included in the species listed because the soil data set is specific to 0 to 0.5-feet depth and in the exposure model, the Texas pocket gopher is only exposed to soil from the 1 to 2-feet depth. The applicability of evaluating risk to the Texas pocket gopher is discussed in the uncertainty section.

Barium, cadmium, copper, lead, selenium, vanadium and zinc are considered COPCs for this exposure pathway. There are NOAEL-HQs that are greater than 1 only for the snake (e.g., barium, cadmium, copper, lead, selenium, vanadium and zinc). An evaluation of the risk assessment for reptiles is presented in the uncertainty section.

6.5.5 East Ditch Freshwater (South Segment) - Conservative Analysis

Water Column Receptors – The maximum detected concentration in surface water was compared to acute freshwater criteria in Table 19. The use of acute criteria is appropriate because the south segment of the East Ditch is intermittent. As shown on Table 19, only aluminum remains as a COPC for surface water.

Groundwater samples were collected from a monitoring well installed adjacent to the south segment of the East Ditch, MWGW02 (Figure 5), for the evaluation of the potential groundwater to surface water pathway. Table 25 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the groundwater samples. Using acute screening values, copper, dieldrin, gamma-BHC, heptachlor, 1-methylnaphthalene, 2,4-dimethylphenol, benzo(a)pyrene, phenanthrene and cyanide are retained as COPCs. Selenium and mercury are retained because they are bioaccumulative. Total PAH does not have a screening criterion.

Benthic Invertebrates – Table 20 shows the screening for sediment in the south segment of the East Ditch against sediment benchmarks and TCEQ sediment PCLs. Barium, beryllium, selenium, thallium, vanadium and cyanide are retained because they do not have benthic screening levels. gamma-Chlordane is retained because its exposure point concentration exceeds the benthic PCL.

Upper Trophic Level Receptors - The south segment of the East Ditch is a freshwater ecosystem which also receives surface water runoff during rain events and potentially groundwater. Table 35 shows the NOAEL-based HQs for the snowy egret and raccoon. Barium and bis(2-ethylhexyl)phthalate, have NOAEL based HQs above 1.

Summary - Table 35 summarizes the COPCs for water column receptors, benthic invertebrates and upper trophic level receptors.

6.5.6 East Ditch Marine (North Segment) - Conservative Analysis

Water Column Receptors – The maximum detected concentration in surface water was compared to marine surface water chronic criteria in Table 23. The purpose of Table 23 was to show detected analytes that are greater than the screening value and to list the detected bioaccumulators. Numerous organochlorine pesticides were detected, and some at concentrations greater than the

screening values (4,4'-DDT, alpha-chlordane, heptachlor, beta-BHC, endrin aldehyde, heptachlor, heptachlor epoxide, and methoxychlor). Mercury and selenium are also considered bioaccumulators, but were not detected above the Texas water quality standards. Aluminum, cobalt and manganese are detected at concentrations that exceed the chronic criteria. These COPCs are retained as COPCs for risk to water column receptors.

As discussed in Section 4.3.2 and shown on Table 26, all representative concentrations are below their respective Tier 2 surface water criteria (^{SW}GW) for the north segment of the East Ditch.

Benthic Invertebrates – Table 24 shows the screening for sediment in the north segment of the East Ditch against sediment benchmarks and TCEQ sediment PCLs. Beryllium, thallium, endosulfan sulfate, and cyanide are retained because they do not have benthic screening levels. Barium, heptachlor, and PAHs are retained because their exposure point concentration exceeds the benthic PCL.

Upper Trophic Level Receptors - The north segment of the East Ditch is a marine ecosystem which also receives surface water runoff during rain events and groundwater. Table 36 shows the NOAEL-based HQs for the snowy egret and raccoon. Barium, bis(2-ethylhexyl)phthalate, endosulfan sulfate, lead, total PAHs, and selenium have NOAEL based HQs above 1.

Summary - Table 36 summarizes the COPCs for water column receptors, benthic invertebrates and upper trophic level receptors.

6.6 Less-Conservative Analysis

TCEQ Required Element 7 requires that the exposure parameters remain consistent with the conservative analysis (e.g., body weight, ingestion rates, and the exposure point concentration), but other Site-specific and COPC-specific factors can be modified. These include the exposure modifying factor (depending on the species home range and Site size). The HQ is calculated with the same NOAEL used in the conservative analysis, but a LOAEL-based TRV is added. For this SLERA, the exposure point concentration is modified from the maximum detected concentration to the 95% upper confidence limit (UCL) and the LOAEL is added as a TRV.

6.6.1 Terrestrial Habitat (North and South Pit) – Less-Conservative Analysis

Most of the Site consists of a mixture of commercial/industrial facilities, including associated parking lots, and maintained (mowed) grassy areas. Significant ecological habitat was not observed within the commercial/industrial facilities and their parking lots. The upper two feet of soils at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt. Approximately 90% of the North Pit area boring logs and approximately 80% of the South Pit area boring logs described gravel and/or caliche within the top two feet. The lots were improved with 6 to 12 inches of caliche base and portions were paved with hot asphalt mix (Goldston, 2010). The land use map (Figure 4) shows that approximately 40% of the North Pit

and South Pit areas are covered by buildings or non-vegetative cover such as asphalt or caliche base. In addition, approximately 75% of the surface of Lot 6 contains equipment and other materials.

Various commercial/industrial buildings, including Robert's Equipment, Adult Video, and warehouse buildings for former tire and fabricating shops, are located within the Site boundaries. Lot 7 (Adult Video) is within the city limits of the City of Corpus Christi. The remainder of the Site is located within the extra-territorial jurisdiction of the City of Corpus Christi. Land use within the Site is either zoned commercial (Adult Video) or light industrial (COCC, 2017). The Site is located within the Port of Corpus Christi Inner Harbor Port Related District (POCC, 2017) and Industrial District Number One (COCC, 2017). In July 1990, The Goldston Corporation recorded an Industrial District Agreement with the City of Corpus Christi for 19.575 acres. According to the City of Corpus Christi geographic information system map viewer, future land use will be heavy industrial. Appendix A-1 contains zoning maps and districts.

Because of the soil type, commercial/industrial facilities, and mowing, as well as future land use considerations, the use of the North and South Pit areas as terrestrial habitat is limited. Photos 1-5 in Appendix A-2 show the grassy portions of the Site, including the commercial/industrial facilities. Figure 5 shows the South Pit and North Pit soil sample locations.

TCEQ defines “disturbed ground” primarily as a location that is predominately urban or commercial/industrial in nature (and thus characterized by human presence and activities) where any habitat that may have once existed has been altered, impacted or reduced to such a degree that it is no longer conducive to use by ecological receptors. (Section 3.3.3.2 in TCEQ, 2017a).

The risk evaluation was completed for the South and North Pit soils, but the quality of the habitat is extremely limited.

South Pit Terrestrial - Less-conservative Analysis

Plants and Invertebrates – As discussed previously, the terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. The COPCs from the conservative evaluation for plants and soil invertebrate values include: barium, chromium, copper, lead, manganese, nickel, selenium, vanadium, zinc, mercury, 2,4-dimethylphenol, beta-BHC, gamma-BHC, and high molecular weight PAHs. There are no community screening values for 4,4'-DDT, dieldrin, endrin, endrin aldehyde, or cyanide. Table 1 shows the initial screening and the source of the screening values (invertebrate, plant or mammal). Table 17 shows the summary of the screening assessment by the two soil depths (0 to 0.5 and 1 to 2 feet).

The habitat associated with the South Pit for plants is limited by the routine mowing conducted at the Site. As described in Section 13.1 of the Ecological Risk Assessment guidance (TCEQ, 2017a) “The ecological PCL is not directly intended to be protective of on-site receptors with limited mobility or range (e.g., plants, soil invertebrates and small rodents)....” Section 7.2.10 discusses the uncertainties associated with the use of the Site as ecological habitat and Section 7.3.1

discusses the uncertainties associated with the benchmark screening values. Based on the limitations of the soil benchmarks for receptors with limited mobility or range, further evaluation of ecological risk to the plant and invertebrate community is not warranted. However, some COPC concentrations at locations within the South Pit area (Figure 8) exceed the community receptor benchmarks by an order of magnitude or more. These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments. These COPCs are chromium, vanadium, zinc, mercury, and beta BHC.

- Chromium and vanadium are not considered final COPCs for community receptors. If the background concentration is used for the screening value, the HQ values are less than 10. In addition, the maximum vanadium concentration of 20.5 mg/kg is less than the Site background concentration (Table 11).
- beta-BHC is not considered a final community COPC because there was only one detection in the 22 samples analyzed from the 0 to 0.5-foot interval (less than 5%).

Final COPCs for community receptors in the South Pit soils based on potential acute risk or potential transport to sediments are mercury and zinc.

Upper Trophic Level Receptors - Table 37 shows the outcome of the less-conservative HQ analysis for the South Pit soils. Exposure parameters are unchanged from the conservative analysis except that the exposure point concentration was modified from the maximum detected concentration to the 95% UCL and a LOAEL-TRV was added to the assessment. Lead, zinc, and 4,4'-DDT are the final COPCs since LOAEL-based HQ's exceed 1.

The exposure area for the South Pit soils is 6.9 acres and this is smaller than the home ranges for the red-tailed hawk, mourning dove, coyote, and armadillo. Table 37 shows the adjustments to the HQs based on the use of the EMFs. The home ranges for the American robin, white footed mouse, eastern cottontail and least shrew are not larger than the South Pit exposure area and therefore it is conservatively assumed that these receptors could be on site 100% of the time.

Final COPCs for the South Pit soils for wildlife are lead, zinc, and 4,4'-DDT. A hazard index (HI) was calculated for 4,4'-DDD, 4,4'-DDE and 4,4'-DDT, but it was driven by the 4,4'-DDT concentrations. The hazard index is presented on Table 37. The average TRV HQ is also presented for those COPCs with a NOAEL-HQs greater than 1.

North Pit Terrestrial - Less-conservative Analysis

Plants and Invertebrates – As discussed previously, the terrestrial community receptor plants and soil invertebrates are assessed in the SLERA using media screening levels. Table 18 shows the maximum detected values for each COPC compared with the lowest of the available screening level. The COPCs from the conservative evaluation for plants and soil invertebrate values include: barium, chromium, lead, manganese, mercury, selenium, vanadium, and zinc. There are no community screening values for many of the organochlorine pesticides or cyanide. Table 2 shows

the initial screening and the source of the screening values (invertebrate, plant or mammal). Table 18 shows the summary of the screening assessment by the two soil depths (0 to 0.5 and 1 to 2 feet).

As described in Section 13.1 of the Ecological Risk Assessment guidance (TCEQ, 2017a) “The ecological PCL is not directly intended to be protective of on-site receptors with limited mobility or range (e.g., plants, soil invertebrates and small rodents)....” Section 7.2.10 discusses the uncertainties associated with the use of the Site as ecological habitat and Section 7.3.1 discusses the uncertainties associated with the benchmark screening values. Based on the limitations of the soil benchmarks for receptors with limited mobility or range, further evaluation of ecological risk to the plant or invertebrate community is not warranted. However, COPC concentrations at some locations within the North Pit area (Figure 8) exceed the community receptor benchmarks by an order of magnitude or more. These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a transport pathway to sediments. These COPCs are barium, chromium, lead, selenium, vanadium, zinc and mercury.

- Chromium and vanadium are not considered final COPCs for community receptors. If the background concentration is used for the screening value, the HQ values are less than 10. In addition, the maximum vanadium concentration of 25.4 mg/kg is less than the Site background concentration (Table 11).

Final COPCs for community receptors based on potential acute toxicity or transport to sediments in the North Pit soils are: barium, lead, mercury, selenium, and zinc.

Upper Trophic Level Receptors - Table 38 shows the outcome of the less-conservative HQ analysis for the North Pit soils. Exposure parameters are unchanged from the conservative analysis except that the exposure point concentration was modified from the maximum detected concentration to the 95% UCL and a LOAEL-TRV was added to the assessment. As shown on Table 38, barium, cadmium, lead, selenium, zinc, and mercury have average TRV HQs greater than 1. Aldrin was detected once out of 54 samples in the 0 to 2-feet bgs soil depth and does not constitute a COPC requiring further assessment because of its low detection frequency (< 5%). Because lead and selenium are COPCs for small ranging receptors (e.g., American robin and least shrew), which have home ranges less than the 4.7-acre North Pit exposure area, no modifications based on area use factors were applied to the model.

Final COPCs for the North Pit soils for wildlife are barium, cadmium, lead, selenium, and zinc.

6.6.2 East Ditch (South) – Less-conservative Analysis

The South segment of the East Ditch was evaluated for exposure in the 0.49 acre riparian area and the 0.6-acre intermittent ditch. Because the South segment of the East Ditch is intermittent, it was evaluated as a freshwater aquatic area and as a dry terrestrial area. Table 35 summarizes the COPCs for the freshwater exposure scenario. Between November and December 2017, a sediment cap was installed in the south segment of the East Ditch (Figure 5). While this evaluation includes

data from locations currently under the cap, the designation of final COPCs is based on COPC concentrations outside the cap area.

East Ditch Riparian Soil (South) - Less-conservative Analysis

Barium, chromium, vanadium and selenium remain community (plant and invertebrate) COPCs (Table 21). The maximum chromium detection of 5.86 mg/kg and the maximum vanadium concentration of 13.8 mg/kg are less than Site background (Table 11); chromium and vanadium are removed as COPCs. Section 7.2.10 discusses the uncertainties associated with the use of the Site as ecological habitat and Section 7.3.1 discusses the uncertainties associated with the benchmark screening values. Based on the limitations of the soil benchmarks for receptors with limited mobility or range, further evaluation of ecological risk for barium and selenium to the plant or invertebrate community is not warranted. The maximum barium concentration outside the cap area of 224 mg/kg (ESSS12) is less than the soil benchmark of 330 mg/kg. The maximum selenium concentration of 1.19 mg/kg (ESSS12) slightly exceeds the Site background of 0.89 mg/kg. The HQ based on background is 1 (based on one significant figure). There are no community level COPCs for this exposure area.

Following the analysis using the modified EPC (95% UCLs), the HQs for barium and selenium are below 1 (Table 39). There are no trophic level COPCs for this exposure area.

There are no final COPCs for riparian soil in the south segment of the East Ditch.

East Ditch Sediment (South) as Soil – Less-conservative Analysis

Barium, chromium, manganese, selenium, vanadium, zinc, mercury, and beta-BHC are community (plant and invertebrate) COPCs (Table 22). The maximum chromium detection of 11.9 mg/kg and the maximum vanadium concentration of 19.8 mg/kg are less than Site background (Table 11). Chromium and vanadium are removed as COPCs. Section 7.2.10 discusses the uncertainties associated with the use of the Site as ecological habitat and Section 7.3.1 discusses the uncertainties associated with the benchmark screening values. Beta-BHC was only detected in EDSSD04 (Figure 6). This location is under the sediment cap. Since there are no detections in sample locations outside the cap, beta-BHC is removed as a COPC. The HQ values for samples collected outside the cap area are 1.3 (manganese), 0.49 (mercury), and 1.0 (selenium). Based on one significant figure, these analytes are not final COPCs for the soil evaluation. Barium (HQ = 4.1) and zinc (HQ = 1.5) are not retained as final COPCs for community receptors, because the HQs are less than 10. Based on the limitations of the soil benchmarks for receptors with limited mobility or range, further evaluation of ecological risk to the plant or invertebrate community is not warranted. No COPC concentrations exceed the community receptor benchmarks by an order of magnitude or more.

Following the analysis using the modified EPC (95% UCLs) and application of the EMF for the Texas indigo snake, there are no trophic level COPCs for this exposure area (Table 40). The barium average TRV-HQs range from 1.1 (American robin) to 1.3 (mourning dove). Based on

significant figures, no average TRV-HQs exceed 1. EPCs were re-evaluated after installation of the sediment cap. The revised EPCs results in average TRV-HQs less than 1 for the avian receptors.

There are no final COPCs for the south segment of the East Ditch when evaluated as soil media.

East Ditch Freshwater (South Segment) – Less-conservative Analysis

Table 35 summarizes the COPCs for water column receptors, benthic invertebrates and upper trophic level receptors.

Water Column Receptors – As shown on Table 19, only aluminum remains as a COPC for surface water. The concentrations in the south segment surface water range from 0.446 to 1.12 mg/l with a geometric mean of 0.60 mg/L. The geometric mean is less than the state water quality standard of 0.991 mg/L (30 TAC 307 Table 1). Aluminum is eliminated as a final COPC (Table 42).

Table 25 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for the groundwater samples. Using acute screening values, copper, dieldrin, gamma-BHC, heptachlor, 1-methylnaphthalene, 2,4-dimethylphenol, benzo(a)pyrene, phenanthrene, and cyanide were retained as COPCs. Between November and December 2017, a sediment cap was installed in the south segment of the East Ditch to prevent surface water from creating a wetting condition that allows for transport of COPCs from the UTU to surface water through the overlying clays (Figure 6). Since the construction of the sediment cap renders the groundwater-to-surface water pathway incomplete in the south segment of the East Ditch, no final COPCs for groundwater are designated.

Benthic Invertebrates – Table 20 shows the screening for sediment in the south segment of the East Ditch against sediment benchmarks and TCEQ sediment PCLs. Barium, beryllium, selenium, thallium, vanadium, and cyanide were retained because they do not have benthic screening levels. Section 7.3.3 provides a discussion of the uncertainty associated with a lack of benthic screening values. These COPCs were not retained as final COPCs. gamma-Chlordane is eliminated as a benthic COPC. The only detection (EDSSD04) is under the sediment cap installed in November 2017. No final COPCs for benthic invertebrates are designated.

Upper Trophic Level Receptors - The south segment of the East Ditch is an intermittent freshwater ecosystem which also receives surface water runoff during rain events. Table 35 shows the NOAEL-based HQs for the snowy egret and raccoon. Barium and bis(2-ethylhexyl)phthalate have NOAEL based HQs above 1. Bis(2-ethylhexyl)phthalate is not a final COPC because the 95% UCL as the EPC results in an HQ less than 1 for both the raccoon and snowy egret.

This portion of the East Ditch would only provide attractive habitat to wading birds when it holds water long enough for a benthic community to be established. In addition, the concrete erosion mat on the sediment cap will limit the attractiveness of the habitat to wading birds. The area of the south segment of the East Ditch is approximately 0.6 acres while the home ranges for the snowy

egret and raccoon are 21 and 1558 acres, respectively. (Section 7.2.8 provides an uncertainty assessment of the snowy egret's home range.) Similar habitat is found nearby and the utilization of these 0.6 acres with adjacent industrial activity is less attractive than nearby undisturbed areas. Following the area use factor adjustment, the NOAEL-based HQ for barium are below 1 for both receptors. There are no final COPCs for the snowy egret or raccoon in the freshwater segment of the East Ditch.

6.6.3 East Ditch Marine (North Segment) – Less-conservative Analysis

Table 36 summarizes the COPCs for water column receptors, benthic invertebrates and upper trophic level receptors.

Water Column Receptors – The maximum detected concentrations in surface water was compared to marine surface water chronic criteria in Table 23. The purpose of Table 23 was to show detected analytes that are greater than the screening value and to list the detected bioaccumulators. Numerous organochlorine pesticides were detected, and some at concentrations greater than the screening values (4,4'-DDT, alpha-chlordane, beta-BHC, endrin aldehyde, heptachlor, heptachlor epoxide, and methoxychlor). Aluminum, cobalt and manganese are detected at concentrations that also exceed the chronic criteria. These COPCs are retained as COPCs for risk to water column receptors.

As discussed in Section 4.3.2 and shown on Table 26, all representative concentrations for the groundwater to surface water pathway are below their respective Tier 2 surface water criteria (^{SW}GW) for the north segment of the East Ditch.

Benthic Invertebrates - Table 24 shows the screening for sediment in the north segment of the East Ditch against sediment benchmarks and TCEQ sediment PCLs. Beryllium, thallium, endosulfan sulfate, and cyanide were retained because they do not have benthic screening levels. Section 7.3.3 provides a discussion of the uncertainty associated with a lack of benthic screening values. Barium, heptachlor, and PAHs are retained because their exposure point concentration exceeds the benthic PCL.

Heptachlor was detected in two of the 22 samples collected in the north segment of the East Ditch. Based on the low frequency of detection, heptachlor is not designated as a final COPC.

The total PAH exposure point concentration of 18 mg/kg is less than the benthic PCL of 24.4 mg/kg. Three total PAH concentrations exceeded the benthic PCL: EDDSD09 (60.94 and 206 mg/kg) and EDDSD07 (28.2 mg/kg). Total PAH concentrations in the 2012 sample event were below the benthic PCL (EDDSD07 at 3.49 mg/kg and EDDSD09 at 3.47 mg/kg). EDDSD09 is located on the south side of the box culvert at Up River Road and EDDSD07 is located on the north side of the box culvert. Urban and roadway runoff may be a contributor of the PAHs to the sample locations adjacent to Up River Road. The Up River Road drainage ditch conveys storm water to the East Ditch culvert from both directions (east and west) which includes Southern Minerals Road west to the East Ditch culvert and from 300 feet east of Goldston Road east to the

East Ditch culvert (NCDPW, 2007). As shown on Table 41, mean PAH concentrations in surface water particulates from runoff in unsealed and asphalt or coal-tar sealed parking lots ranged from 54 to 3,600 mg/kg (Mahler, et. al., 2005). Based on these lines of evidence, PAHs are eliminated as final COPCs for benthic invertebrates in the north segment of the East Ditch.

Upper Trophic Level Receptors - The north segment of the east ditch is a perennial marine ecosystem. Table 36 shows the NOAEL-based HQs for the snowy egret and the NOAEL and LOAEL-based HQs for the raccoon. In the less-conservative assessment, a home range factor for the raccoon and snowy egret was applied to the exposure calculations.

The area of the north segment of the East Ditch is approximately 2.2 acres while the home ranges for the snowy egret and raccoon are 21 and 1558 acres, respectively. Similar habitat is found nearby and the utilization of these 2.2 acres with adjacent industrial activity is less attractive than nearby undisturbed areas. Following the area use factor adjustment, the HQs are all below 1 except for the NOAEL-based HQ for endosulfan sulfate for the snowy egret. The final COPC for the snowy egret is endosulfan sulfate and there are no final COPCs for the raccoon in the marine (north) segment of the East Ditch. Endosulfan sulfate has a low detection frequency in that it was detected in 2 of 22 samples. In addition, the maximum concentration for endosulfan sulfate in the north segment of the East Ditch (0.023 mg/kg) is slightly lower than the maximum concentration in the Up River Road drainage ditch (0.028 mg/kg).

7.0 UNCERTAINTY ANALYSIS

The characterization of uncertainty is a component of the ecological risk assessment process (USEPA, 1997). This SLERA was prepared in a manner consistent with that generally used in professional practice and in accordance with USEPA and TCEQ guidance. However, the process requires careful professional judgment in the selection of assumed values and conditions when information is not available. The purpose of this section is to provide information concerning the validity of each assumption and their effect on the accuracy or reasonableness of the risk assessment. The sections below discuss the uncertainties in the screening level ecological risk assessment process as they pertain to the Brine Service Company Superfund Site.

7.1 General Sources of Uncertainty

Due to the multiplicity of potential receptor species and general lack of detailed knowledge and/or variability surrounding their life cycles, feeding habits, and relative toxicological sensitivity, the uncertainty surrounding estimates of ecological hazard can be substantial. The criteria used in this assessment are intended to provide a conservative assessment of potential ecological hazards. This SLERA did not account for site-specific factors such as chemical bioavailability over time, adaptive tolerance, reproductive potential, the presence of nearby habitat not associated with the Site and recruitment from similar adjoining areas. Such factors would tend to mitigate the degree and ecological significance of loss or impairment of a portion of some ecological population(s) due to both chemical and physical stressors in the area. The approach used in this assessment does develop protective (conservative) estimates of exposure, which likely indicate a potential for hazard that is greater than actually encountered by organisms that might utilize the Site. The criteria used in this assessment are all chemical-specific and as such, cannot address the additive, antagonistic, or synergistic effects of the mixtures of chemicals typically found in the environment. Furthermore, the SLERA does not take into account the nature and constitution of the ecosystem present at the Site, site-specific conditions regulating chemical contact and bioavailability, the potential toxicity of other constituents that were not quantified, or the pervasive influence of physical stressors associated with the disruptions caused by human activities.

7.1.1 Uncertainties in Screening-Level Problem Formulation and Ecological Effects Evaluation

Uncertainties are introduced in the first step of the risk assessment process if samples do not represent Site media, if analytical methods are not adequate for Site constituents and matrices, and if substantial amounts of analytical data are qualified or rejected, and if constituents are included in the risk assessment that are not related to the Site. Uncertainties can also be introduced in the COPC identification process if evaluations such as background comparisons for inorganic constituents and a weight-of-evidence evaluation of the relationship of a constituent to the Site are utilized to eliminate analytes for the screening process. For example, a weight-of-evidence approach could have been used to drop an analyte from being identified as a COPC and evaluated in the SLERA. In this SLERA, however, a conservative approach of evaluating the maximum

concentration of all detected analytes was utilized regardless of the frequency of detection, and without a weight-of-evidence evaluation. After evaluation of the data, frequency of detection was used to remove non-bioaccumulative COPCs from further evaluation if sample size was greater than or equal to 20.

7.1.2 Samples Representing Site Media

If the samples do not adequately represent media at the Site, hazards/risk estimates could be over or underestimated. The sampling and analysis plans were designed to investigate anticipated areas of contamination and delineate area(s) of concern at the Site. Sample locations were identified in the RI/FS Work Plan using a probability based design and systematic grid sampling with a random start using Visual Sampling Plan Version 6.0 (Battelle, 2010). The statistically-based sampling design was augmented by judgmental samples. Therefore, there is less chance that the hazard/risk estimates are biased low and more chance that the hazard risk estimates are biased high.

7.1.3 Soil Depths

Data from samples from two soil depths (0 to 0.5-feet bgs and 1 to 2-feet bgs) were used for this SLERA. Most ecological receptors that do not burrow are only likely to come into direct contact with the first few inches of soil, except in areas for which scouring may expose subsurface soils. Predatory animals may also be exposed to subsurface contaminant levels through consumption of prey that resides below the surface.

Site conditions would make exposure to subsurface soils unlikely. The soils with elevated metals concentrations are associated with the upper two-feet of fill at the Site. The boring logs provided in Appendix C of the RI Report (Volume I) indicate that the upper two feet of soil at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt. Approximately 90% of the North Pit area boring logs and approximately 80% of the South Pit area boring logs described gravel and/or caliche within the top two feet. The lots were improved with 6 to 12 inches of caliche base and portions were paved with hot asphalt mix (Goldston, 2010). The Site map (Figure 2) shows that approximately 40% of the North Pit and South Pit areas are covered by buildings or non-vegetative cover such as asphalt or caliche base. In addition, approximately 75% of the surface of Lot 6 contains equipment and other materials. Because the surface soils are hard-packed with caliche, which makes it difficult for burrowing mammals to obtain food by probing for insects and other animal life in the ground (nine-banded armadillo) or by seizing plants from below and pulling food into the burrow (Texas pocket gopher), the exposure has been overestimated.

7.1.4 Analytical Methods Used to Test Samples

If the standard analytical methods used do not apply to some constituents that are present at the Site, risk could be underestimated. Since the analytical methods at the Site were selected to address constituents that are known or suspected to be present on the basis of the Site history, the potential

for not identifying a COPC is reduced. As allowed by SW-846, the laboratory enhanced the analytical methods and reported to the sample detection limits. As discussed in the Data Usability Summary in the RI Report (Volume I), precision and accuracy of the enhancements were demonstrated by the analysis of laboratory control samples and project-specific matrix spike/matrix spike duplicate samples. Therefore, there is less chance that the hazard/risk estimates are biased low due to non-detected analytes.

The analytical method used to evaluate PCBs was based on commercial Aroclor mixtures and not individual congeners. There are 209 distinct PCB congeners. The number and placement of the chlorine atoms on the biphenyl molecule determines how the congener is named and dictates its environmental fate and toxicity. PCBs in the environment most likely occur as mixtures of congeners and are subject to weathering and degradation based on the degree of chlorination and position of chlorine on the biphenyl molecule. The analytical method used to evaluate Aroclors at the Site may or may not represent all of the congeners present at the Site. The concentrations used in the SLERA may underestimate or overestimate exposure, depending on the degree of weathering, degradation, and metabolism of the congeners present in the environmental sample compared to the Aroclor standard chromatographic patterns.

7.1.5 Qualified Data for COPCs

With limited exceptions, the analytical data are usable for the purposes of identifying COPCs and providing data for the SLERA. Due to the large amount of data obtained for the RI (approximately 93,000 analytes), individual sample/analyte results are not discussed below. Only significant findings that may impact the usability of the data are discussed.

Low Bias

The use of flagged data increases the level of uncertainty associated with the exposure point concentration in the risk assessment, resulting in a concentration that may be either biased high or low.

The quality control criteria for laboratory control sample recoveries for VOCs and SVOCs are 60-140%R. The LCS recoveries for many analytes, especially phenolic compounds and other reactive SVOCs, were less than 60%. While recoveries less than 60% for these compounds are acceptable for a general use method such as SW-846 8270, the quality control criteria are set to evaluate where significant biases exist in the data set that may affect the identification of COPCs and the evaluation of risk to human health or the environment.

High Bias

Portions of the data set may overestimate the risk to human health and the environment due to high bias in the data. Data for approximately 115 analytes are qualified as estimated with a high bias (JH). Note that only detected analytes are qualified. Since nondetected analytes are not qualified,

there still may be bias in the data set. Less than 0.2% of the analyte data are qualified as estimated with a high bias.

Nondetects

Results that are “U”-flagged by the data validation process were not included in the risk assessment data set. The data validator only assigned “U” flags to results that meet the criteria for evaluating blanks (URS, 2010). The presence and concentrations of analytes may be overestimated if these analytes were introduced into the sample during field or laboratory activities. The table below lists those analytes for which greater than 5% of the dataset are qualified as nondetect (U). Detections of the analytes listed below should be used with caution in evaluating risk, since these analytes may not be present in the samples or may be present at concentrations lower than stated in the analytical reports.

Analyte	Number/ Percent qualified as “U”	Analyte	Number/ Percent qualified as “U”
Zinc	107 / 17	Naphthalene	47 / 7.6
Thallium	71 / 12	Methylene chloride	40 / 6.5
Selenium	56 / 9.1		

Rejected Data

In total, data for 19 individual analytes (approximately 0.2% of the data) from eleven samples (approximately 1.8% of the samples) were rejected. Rejected analytes were: aldrin, caprolactam, 4-chloroaniline, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene, n-nitrosodiphenylamine, pentachlorophenol, and styrene.

As discussed in the Quality Assurance Project Plan, the completeness requirement for the laboratory measurements is 95 percent for aqueous samples and 90 percent for soil samples. The completeness requirements for the project are met.

The use of flagged data increases the level of uncertainty associated with the exposure point concentration. Overall, however, the quality of the data was sufficient for the purposes of ecological risk assessment.

7.1.6 Constituents of Potential Concern Selection Process

There is very little uncertainty associated with the COPC selection process for the ecological exposure areas. The analytical suite used to determine the nature, magnitude, and extent of occurrence of chemical constituents in the ecological exposure area was comprehensive. The site-specific list of analytes included VOCs, SVOCs, PAHs, metals, pesticides, and PCBs. All detected constituents were subject to analysis in the SLERA. Data for aggregate parameters (such as high molecular weight PAHs, total PAHs, or total PCBs) are potentially biased high since the sums included non-detected components using one-half the sample detection limit as a surrogate

concentration. In order to account for the environmental mixtures of PCBs resulting from the weathering of the Aroclors, total PCB concentrations were determined by summing the concentrations of the detected Aroclors with one-half the sample detection limit for the non-detected Aroclors. Background comparisons were not used to exclude naturally occurring constituents from the SLERA process. The conservatism associated with the COPC selection process is increased because all detected constituents were included in the SLERA. The uncertainty is increased because infrequently detected analytes may be selected as COPCs.

7.2 Uncertainty with Exposure Assessment

This section discusses the uncertainties in the exposure estimate and risk characterization for terrestrial plants; specific ecotoxicity issues for PAHs, manganese, and mercury; and bioavailability for metals in soil. In addition, the risk to amphibians and reptiles is discussed.

7.2.1 Exposure Concentrations

Risk is most likely overestimated in the exposure assessment because the selected exposure point concentrations are either the maximum detected or the 95% UCL concentrations. It is unlikely that most receptors would be consistently exposed to the maximum or to an upper-bound estimate of the average concentration (i.e., the 95% UCL) for long periods. The TCEQ has selected the 95% UCL as the preferred exposure point concentrations for the benthic invertebrate community and wildlife since the goal is to protect benthic organisms and wildlife at a community level, rather than individually (TCEQ, 2013). It is unlikely that aquatic receptors would be consistently exposed to the maximum concentration of the COPCs in undiluted groundwater. This assumption is due to the mixing and dilution that would occur upon discharge to surface water and the transient nature of most aquatic organisms and wildlife. Use of this upper-end estimate of exposure as the exposure point concentrations is intentionally conservative for the SLERA.

7.2.2 Detected Concentrations

There is uncertainty that the maximum and minimum detected concentrations for COPCs may potentially not be the actual highest and lowest concentrations at the site. Since the actual high and low concentrations may not have been detected, the calculation of the exposure point concentrations (e.g., maximum detected concentrations and 95% UCLs) may overestimate or underestimate the actual risk at the Site to ecological receptors.

7.2.3 Evaluation of Risk for Constituents that Might Not Be Site-Related

Concentrations of metals and PAHs in soil at the ecological exposure areas could have been contributed by other sources. The material associated with the historical operations of the South Pit (drilling fluids) would most likely not contain some metals or organochlorine pesticides. However, all detected constituents were evaluated in this SLERA and risk is likely overestimated.

Metals/Essential Nutrients

Metals and essential nutrients are naturally occurring constituents, and there are established background concentrations for naturally occurring constituents available for use at Texas sites. The metal and nutrient background concentrations are represented by Texas-specific median background concentration (30 TAC 350.51(m)). Exceeding a Texas-specific median background concentration also does not automatically indicate that constituent concentrations are elevated at a site.

Representative background concentrations for metals were calculated from the Catholic Solitude surface soil data set as the lower of the background maximum concentration or the 95% UPL. If the maximum concentration or the 95% UPL is lower than the Texas-specific median background concentration, the Site background defaulted to the Texas-specific median background concentration. Table 11 lists the detected and non-detected constituents in the background soils. Table 11 includes both the Texas-specific median background concentrations and the representative background concentrations.

PAHs

PAHs come from a variety of sources; most of the background sources are from the combustion or burning of fuels. Table 41 summarizes data sets documenting background concentrations of PAHs in soil. Background PAH concentrations range up to 583 mg/Kg (ATSDR, 1995). If the three highest concentrations, the Chicago 95% percentile concentration of 112 mg/Kg (Kay et.al 2003), the 231 mg/Kg 95% percentile concentration in Massachusetts (MADEP, 2002) and the ATSDR concentration of 583 mg/Kg (ATSDR, 1995), are excluded from the data set, the urban background PAH concentrations range from 12.3 to 40.9 mg/Kg. The maximum detected concentrations of total PAHs from the North Pit 0 to 2-feet bgs soils is approximately 4 mg/Kg, and the maximum total PAH concentration in the South Pit 0 to 2-feet bgs soils is 38 mg/Kg.

In the East Ditch upstream (south of IH-37) sediment, the maximum total PAH detection was 4.5 mg/Kg at a sample collected near Leopard Street. The Up River Road sediment had a maximum detection of 195 mg/Kg at a sample collected at the intersection of Hunter Road. Total PAHs in sediment from the north segment of the East Ditch ranged from 0.052 to 206 mg/Kg; however urban and roadway runoff may be a contributor of the PAHs to the sedimentary material. As shown on Table 41, mean PAH concentrations in surface water particulates from runoff in unsealed and asphalt or coal tar sealed parking lots ranged from 54 to 3,600 mg/kg (Mahler, et. al., 2005).

Background/Upstream Surface Water and Sediments

Samples were also collected in the East Ditch upstream of the Site to provide an understanding of the contribution from anthropogenic off-site sources to COPC concentrations identified at the confluence of the East Ditch and the Up River Road Ditch.

Table 12 compares the detected constituents in the upstream surface water to screening values. Constituents detected at concentrations greater than screening-levels or detected and considered

bioaccumulative in upstream surface water include aluminum, thallium, organochlorine pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha- and gamma-chlordane, dieldrin, endrin, and heptachlor epoxide), and cyanide.

Table 13 also compares the detected constituents in the upstream sediment to screening values. Metals (cadmium, copper, manganese, nickel, selenium, zinc, and mercury), and total PAHs were detected at concentrations greater than screening levels or were detected and considered bioaccumulative.

Up River Road Drainage Ditch

Samples were also collected along Up River Road to provide an understanding of the contribution from anthropogenic off-site sources to COPC concentrations identified at the confluence of the East Ditch and the Up River Road Ditch.

Table 14 compares the detected and non-detected constituents in the Up River Road surface water to screening values. Constituents detected at concentrations greater than screening-levels or detected and considered bioaccumulative in Up River Road surface water include metals and organochlorine pesticides.

Table 15 compares the detected and non-detected constituents in the Up River Road sediment to screening values. Metals, alpha-BHC, 1,1'-biphenyl, bis(2-ethylhexyl)phthalate, carbazole, dibenzofuran, and low, high and total PAHs were detected at concentrations greater than screening levels or were detected and considered bioaccumulative. 2-Nitroaniline, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-nitrophenol, bis(2-chloroisopropyl)ether, n-nitroso-di-n-propylamine, and endosulfan sulfate were detected in sediment samples. No screening values were available to evaluate these constituents. Only endosulfan sulfate was detected in the East Ditch north or south segment sediment samples.

7.2.4 Selection of Wildlife Species Subject to Evaluation

Birds and mammals were selected to represent wildlife species that may forage at the Site. Because toxicity potential to wildlife in one phylogenetic class essentially is not transferable to another class, the SLERA does not represent toxicity potential to reptiles and amphibians. A general lack of toxicity data needed to characterize exposure to reptiles and amphibians and the inability to extrapolate toxicity data across one phylogenetic class to another (e.g., mammals to reptiles) with any confidence lends uncertainty that the outcome of the SLERA represents toxicity potential to all wildlife. The relatively sedentary behavior of some of the reptiles and amphibians may substantially increase their vulnerability to exposures (compared to most predatory birds and mammals). Another source of potential uncertainty is the degree of foraging and overall Site use by ecological receptors, given the myriad factors that influence animal behavior. This uncertainty may result in underestimating or overestimating the potential ecological risk posed to all wildlife by the presence of constituents in environmental media.

7.2.5 Dermal and Inhalation Exposure Pathways

Dermal exposure pathways for wildlife are typically not characterized; however, the relative contribution of this pathway is expected to be minimal. The dermal exposure for reptiles is unknown. The SLERA assumes that the majority of potential exposures of ecological receptors to COPCs are expected to be attributable to incidental ingestion of soil, and to ingestion of exposed prey species. Both of these pathways were quantified and used to generate risk estimates for terrestrial and aquatic exposures. The lack of dermal exposure information likely adds an insignificant amount of uncertainty to the risk estimates.

Inhalation exposure was not evaluated in this SLERA. VOCs were detected sporadically across the Site in the various media evaluated and no VOC concentrations exceeded ecological screening criteria in any media. Inhalation exposure is likely to be minimal at this Site because the soil conditions prohibit burrowing into the subsurface.

7.2.6 COPC Risk to Amphibians

Since the 1980s, scientists have been researching and documenting the overall decline in the health and abundance of amphibian populations. Global declines in amphibian populations have been attributed to a number of anthropogenic activities, including habitat destruction, habitat alteration, introduction of exotic species, exposure to environmental contaminants, climate change, increased acid precipitation, and increased ultraviolet flux associated with ozone depletion. Studies have shown that declines in amphibian population health have also taken place in relatively pristine habitats such as national parks and reserves where specific environmental stressors are not readily apparent. Research has also shown that amphibians tend to be sensitive indicators of environmental stress from contaminant exposure as a result of their unique life history and physiology. Amphibians commonly travel between aquatic and terrestrial habitats and life-history requirements potentially expose this group of vertebrates to contaminants in surface water, sediments and soils at various intensities, depending on developmental stage and the life history unique to each species. In addition to their unique life history, the physiological properties of amphibians heighten their exposure to contaminants in the environment. Amphibians are exposed to contaminants through the direct uptake from water and substrate as well as the ingestion of sediments, soils and food items. The skin of amphibians is thin and highly permeable serving as part of the respiratory system. This permeability maintains the organisms balance in nature, but also creates a route for the potential for uptake and intensifies the risk of contaminant exposure to amphibians by permitting chemical transport across membranes. Amphibian toxicity is generally under-represented in the literature (ENSR, 2004). A summary of the available amphibian aquatic toxicity data for lead is presented below.

Endpoint	Lead (mg/L)	Endpoint	Lead (mg/L)
Behavioral	0.75 – 1.0	Developmental	0.070 - 10
Biochemical/Cellular	0.5 – 1.0	Mortality	0.47 - 105

All of these reported toxicity values are greater than the chronic surface water criteria of 0.0053 mg/L used for the evaluation of the north segment of the East Ditch. Therefore, based on the available toxicity data, the application of the surface water criteria is protective of amphibians found in the East Ditch.

7.2.7 COPC Risk to Reptiles

During the past decades, reptilian toxicology has made up a disproportionately small percentage of toxicological studies of vertebrates. Characteristics of some reptile species make them difficult to study, including long life span and generation time, low fecundity, and incompatibility with laboratory handling techniques. Reptile species are linked by a number of traits (e.g., ectothermia, pulmonary respiration, epidermal scales, and internal fertility), yet possess a diverse array of life history characteristics and inter-species differences (e.g., population distributions, migration patterns, diets, and metabolic processes) (Gardner and Oberdorster, 2006).

Reptiles are considered a globally declining taxon. Hypotheses for reptile decline include: habitat loss and degradation, invasive species, disease, parasitism, global climate change, and environmental pollution (Gibbons et al., 2000). Detecting population declines in reptile populations is inherently difficult as a result of their cryptic or secretive nature, large home range size, low population densities, and lack of congregational behavior (Irwin and Irwin, 2006).

Currently, much less is known about the accumulation and effects of COPCs in reptiles than in any other vertebrate class, making prediction of COPC impacts on reptiles difficult. Risk predictions based on toxicity thresholds established for other vertebrates (e.g., birds and fish) may be inappropriate for many reptiles because of their unique combination of physiological and life history characteristics (e.g., long life span, relatively small home ranges, high trophic position and ectothermic physiology) (Hopkins et al., 2002). As such, the quantitative differences between reptiles, birds and mammals is unknown and therefore uncertain. Reptiles may respond differently than birds and mammals to some environmental contaminants because their metabolic rates may slow the elimination and detoxification of toxic substances. Reptiles may maintain higher body burdens of COPCs. Many reptile species are known to store significant amounts of body fat, which may serve to bioaccumulate lipophilic COPCs. A number of reptiles are predators or scavengers that occupy high positions in trophic food chains potentially resulting in an increased exposure to persistent contaminants as a result of biomagnification (Selcer, 2006).

Reptiles can be exposed to COPCs by several routes, including ingesting contaminated material, contact with skin, maternal transfer into eggs and embryos, and uptake from the nest materials by incubating eggs. Although ingestion of contaminated food is probably one of the most important routes for COPCs to enter reptiles and other terrestrial vertebrates, ingestion of soil could also be an important route for the uptake of soil COPCs (Rich and Talent, 2009).

Of the types of reptiles, turtles appear to have been studied more frequently than crocodilians, lizards or snakes and most of the studies have focused on organic contaminants (Hopkins et al.,

2002). In general, past reptile studies have focused on measuring body burdens of various pollutants from samples collected in the field. While these data are useful for understanding historical exposures of given populations, the actual risks and population-level effects of pollution on reptiles is still largely unknown and generally understudied (Wier et al., 2010).

Relatively few laboratory studies have been conducted on the dose-response of toxicants and no standardized tests involving reptile models are in use (Talent et al., 2002). Campbell and Campbell (2000, 2002) reviewed the open literature for metals data for reptiles and reported one study using snakes in their 2000 publication and three effects studies for lizards and five for snakes in their 2002 publication. Campbell and Campbell (2000) states: “The available data on reptiles were too scanty to allow for meaningful analysis of levels or effects.” Fryday and Thompson (2009) collated toxicity data of chemicals to reptiles available in the scientific literature. Few values for toxicity were found and most studies did not calculate LD₅₀ or LC₅₀ values, but only reported mortality or symptoms. The lack of standard dose-response toxicity testing makes determining a toxicity reference virtually impossible or very imprecise.

The reptile based toxicity data is limited with the majority of data focused on biological accumulation with no clear demarcation of no or lowest effect levels or even dose response relationships. The toxicity endpoints of growth and survival traditionally used for mammals and birds may not be the most appropriate endpoints for the snake; however, endpoints such as lizard sprint speed and turtle righting time are also not applicable to the snake. According to Grillitsch and Schiesari (2010): “the mechanistic understanding of the toxicokinetics of metals in reptiles remains poorly developed and must be addressed in future research to characterize shortcomings for taxa and compounds, and to link toxicodynamics and toxicokinetics (i.e., fate and effect of metals in reptiles).”

The assessment of the Texas indigo snake is highly uncertain. The model assumes a soil ingestion rate similar to other carnivores of 2.8%. The food ingestion rate was modeled using Nagy (2001) for carnivorous reptiles. The concept of a kilogram per day ingestion rate may be incorrect for reptiles. For instance, Hopkins et al (2004) exposed female brown house snakes to selenium in prey by offering meals equal to 25% of the snakes body mass two to three times a month. In Hopkins (2005), the western fence lizard was fed 5% of their body mass, four days a week and on the fifth day, a ration equaling of 10% of its body mass. Thus, the feeding regime resulted in a weekly ration of 30% of each lizard’s body mass. The assumption of a daily intake is not applicable to snakes, but this impact of this uncertainty is unknown. Additionally the reptilian metabolic processes during food digestion are different than the mammalian model and the effect on COPC exposure is unknown. The snake exposure model used in this SLERA conservatively used avian TRVs modified by a factor of 10 to account for species differences; however, because of the significant uncertainties in the exposure model and toxicity data, the resulting hazard quotients were not considered in the risk characterization of the Site. Reptiles may be present at

the Site, but exposure is expected to be infrequent and it is unlikely that the Texas indigo snake would be present for extended periods of time for the following reasons:

- the industrial nature of the exposure areas and surrounding areas;
- the small ecological exposure area (north segment of East Ditch is 2.2 acres) in relation to the large home range of the Texas indigo Snake at over 200 acres; and
- the active roadways fragmenting the habitat.

Because neither the exposure model nor the toxicity data are considered acceptable, the use of the snake in a terrestrial ecological risk assessment is too uncertain to be considered value added information for decision making purposes at the Site. Therefore, the evaluation of reptiles in the ecological risk assessment should remain in the uncertainty section of the document and calculation of hazard quotients or preliminary remedial goals based on the snake model should not be determined or incorporated into the ecological risk assessment.

7.2.8 Snowy Egret Home Range and Exposure Variables

There is uncertainty with the predicted home range or foraging range of the snowy egret. A home range for the snowy egret was not located in the scientific literature. Studies have documented average round trip distances to feeding sites ranging from 11 to 16 kilometers (km) for the great egret (*Ardea alba*) (Brzorad et.al., 2015). Flight distances to feeding sites differed among individuals and increased with breeding stage. The mean foraging distance for the great blue heron is 7 to 8 km with a maximum range of 15 to 20 km with a feeding territory of 8.4 hectares (21 acres) (with a standard deviation of 5.4 hectares) (EPA, 1993). Based on the similarity in feeding habits and foraging distances, the feeding territory of the great blue heron is used as a surrogate home range for the snowy egret.

Master et al (2005) studied selection of foraging area for snowy egrets and found that the egret and other wading birds would select foraging patches based on physical and social environments and on the direct availability of prey in pools. Water depth is a major factor in determining the number of birds that use an area. “That is, snowy egrets should be better able to disturb prey fish when wading into a pool relative to when foraging by leaning over the edge, as they often do for deep pools. Typical egret foraging behavior such as ‘foot stirring’ should work more effectively when the birds are capable of disturbing fish, making prey more vulnerable to capture.” Trocki and Patton (2006) found that great and snowy egrets fed primarily on nekton, crustaceans, and other aquatic invertebrates associated with open water and flooded marsh surfaces. Great and snowy egrets showed strong preferences for pool habitat and did not prefer ditches.

It is unknown how “attractive” the East Ditch is to the wading birds represented by the snowy egret. In addition to the close proximity of roadways and commercial/industrial facilities, the concrete erosion mat on the sediment cap will limit the attractiveness of the habitat to wading birds. The depth of water, type and density of vegetation in the East Ditch as compared to the

more attractive aquatic resources in the area will likely reduce the exposure frequency and duration of wading birds to the sediments and surface water in the East Ditch.

7.2.9 Exposure Media and Pathways

For the raccoon and snowy egret food chain evaluations, the amphibian, fish and aquatic insect concentrations were based on an uptake factor multiplied by the sediment concentration and does not include modeling using the concentrations in surface water. The potential contribution of exposure via ingestion of tissues that accumulate COPCs via water exposure is not represented in this SLERA. The sediment to tissue pathway is preferred over the surface water to tissue pathway because the concentrations in sediment are higher than those in water. The dose to wildlife receptors could be underestimated because the surface water to tissue exposure pathway is not included.

7.2.10 Ecological Value of Site

The ecological diversity and value of the site has been reduced by industrial activities and the installation of a cap in the southern portion of the East Ditch. Figure 4 shows the areas of impervious cover and the placement of the pipeline easements. Because of the industrial development on and around the site, the proximity of the site to major roadways and the maintained vegetative cover, the site is considered disturbed. TCEQ defines “disturbed ground” as a location that is predominantly urban or commercial/industrial in nature (and thus characterized by human presence and activities) where any habitat that may have once existed has been altered, impacted, or reduced to a degree such that it is no longer conducive to use by ecological receptors (Section 3.3.3.2, TCEQ, 2017a). The assumptions used in this SLERA overestimate exposure for the community and wildlife receptors.

7.3 Uncertainty with Effects Assessment

This section discusses the uncertainties in the media-based screening levels, toxicity data selection, bioavailability, bioaccessibility, and metabolism.

7.3.1 Media-Based Screening Levels

The selected ecological screening levels are conservative threshold doses primarily extracted from the open literature and regulatory guidance documents. Numerous factors that may reduce the potential for effects are not considered at all or are assumed to operate at minimum levels in the derivation of these screening-level benchmarks (e.g., the assumption of 100% bioavailability of the accumulated intake, no consideration of digestion and elimination mechanisms, and no consideration of detoxification or metabolic mechanisms). Therefore, given the inherent conservatism of the exposure estimation process, it is uncertain whether adverse effects would be observed if Site-related concentrations exceed one or more screening levels.

Conservatism of Ecological Soil Screening Values – Screening values derived from a variety of sources, such as TCEQ, NOAA SQuRT, USEPA soil screening levels or USEPA Region 5

screening levels, were used in this SLERA as a measure of potential ecological risk. Many of the screening criteria are based on protection of plants and soil invertebrates. The screening criteria protective of mammals, such as many of those from Region 5, are based on back calculation of trophic models and would therefore be protective of upper trophic level receptors. The level of confidence in these screening values varies and therefore screening values should be used in conjunction with the Site factors discussed in the SMDP.

Surface Water Criteria for Aluminum – Aluminum is ubiquitously distributed throughout surface soils, aquatic sediments, groundwater, and surface water. Concentrations of total aluminum in freshwater vary, ranging from 0.0009 to 210 mg/L and concentrations of dissolved aluminum range from 0.0008 to 20.6 mg/L (EPA, 2017). The aqueous chemistry for aluminum is complex. Aluminum can react with ions and organic matter to form soluble complexes. The primary importance for fate and transport of aluminum is interactions with pH. At neutral pH, aluminum is nearly insoluble but solubility increases exponentially in either acid or basic conditions. At pH values between 6.5 and 9.0 in freshwater, aluminum occurs as monomeric, dimeric, and polymeric hydroxides and as complexes with fulvic and humic acids and anions.

Aluminum toxicity data on estuarine/marine species is a data gap (EPA, 2017). Insufficient data are available to calculate an estuarine/marine final acute value. For the available data, species mean acute value LC₅₀ ranged from 0.097 (*Ctenidrilus serratus*) to 10 (*Nitokra spinipes*) mg/L. The geometric mean of the five studies, 0.75 mg/L, was chosen as the benchmark for the East Ditch north segment and groundwater-to-surface water pathway evaluations.

Surface Water Criteria for Manganese – Manganese is ubiquitously distributed throughout surface soils, aquatic sediments, groundwater, and surface water. Concentrations of manganese in fresh water vary widely, ranging from below detection to several hundred mg/L (NAS, 1973). Few acute or chronic toxicity studies have been conducted with manganese and no USEPA national ambient water quality criteria have been promulgated. The value of 0.1 mg/L is used as the marine surface water screening value. This chronic value is from the British Columbia Water Quality Guidelines, but there is little information provided as to the derivation of this value and no acute value is presented. There is uncertainty associated with the benchmark value of 0.1 mg/L. There is limited information on the aquatic toxicity of manganese.

Terrestrial Plant and Soil Invertebrate Benchmarks – The benchmarks protective of the terrestrial plant and soil invertebrate communities are from a variety of sources including Oak Ridge National Laboratory (ORNL) and EPA's Soil Screening Levels. The ORNL values are based on individual studies with safety factors applied to address uncertainties. The EPA SSLs for plants and soil invertebrates are generally geometric means of the maximum acceptable toxicant concentrations values based on a variety of test species under various test conditions.

The soil invertebrate and plant benchmarks for **chromium** of 0.4 and 1 mg/kg, respectively, are derived from Efroymson et.al. (1997a, 1997b). The plant benchmark of 1 mg/kg is based on four

soil studies with hexavalent chromium. The invertebrate benchmark of 0.4 mg/kg is based on the work of Abbasi and Soni (1983) with hexavalent chromium. A safety factor of 5 was applied to the 2 mg/kg lowest observed effects concentration because it caused a 75% reduction in earthworm survival. Efroymson et. al. (1997a) stated that confidence in the benchmark was low because it was based on five reported concentrations causing toxicity. Plant toxicity values ranged from 9 to 138 mg/kg in the thirteen studies summarized in the EPA SSL document (EPA, 2008). Two earthworm studies with a toxicity value of 57 mg/kg were reported in the EPA SSL document. Data were insufficient to derive Eco-SSLs for plants and invertebrates. Confidence in the chromium benchmarks is very low. Toxicity was observed in the benchmark studies at concentrations well below the Site (and TCEQ) background of 30 mg/kg.

The plant benchmark for **lead** is derived from four test species (loblolly pine, red maple, clover and ryegrass) for which lead toxicity data are available and the benchmark is equal to 120 mg/kg dry weight (EPA, 2005b). The individual toxicity values for lead ranged from 22 mg/kg for ryegrass to 316 mg/kg for clover. The EPA chose data from tests performed using soil conditions favoring high bioavailability or upland aerobic soils (low pH and organic matter). The preferred endpoint for plant was biomass production, as it is normally the most sensitive measurement. Other studies listed in EPA (2005) but not used in the development of the SSL list no effect levels for lead as high as 1,000 mg/kg and low effect levels as low as 50 mg/kg. The variability of the data suggests toxicity to a plant community is difficult to assess based on studies using one plant species under controlled test conditions. In addition, soil conditions for the test data are not similar to the Site soil conditions; the soil pH at the Site ranges from 7.05 to 8.56 units, consistent with calcareous soils.

The soil benchmark of 0.1 ppm was established for **mercury** based on the work of Abbasi and Soni (1983). *Octochaetus pattoni* survival and cocoon production were reduced 65% and 40% at 0.5 parts per million (ppm), the lowest concentration tested. A safety factor of 5 was applied to the 0.5 ppm lowest observed effects concentration because it caused a 65% reduction in earthworm survival. The confidence in this benchmark is low because of the limited amount of data (Efroymson et al., 1997a).

The plant benchmark for **selenium** of 0.52 mg/kg is derived from the EPA SSL (2007c) document. Eight studies were used to derive the plant benchmark which is the geometric mean of the maximum acceptable toxicant concentration and 20% effective concentration values for six species under different pH and organic matter test conditions. The benchmark is slightly lower than the Site soil background of 0.89 mg/kg.

The plant benchmark for **vanadium** of 2 mg/kg is derived from Efroymson et.al. (1997b). Two studies were reported with toxicity effects at 2.5 and 50 mg/kg. The plant toxicity values were 100 mg/kg in the two studies summarized in the EPA SSL document (EPA, 2005c). Data were insufficient to derive Eco-SSLs for plants and invertebrates. Confidence in the vanadium

benchmark is very low due to insufficient studies. The benchmark is set at value below the Site (and TCEQ) soil background of 50 mg/kg.

The soil invertebrate **zinc** value of 120 mg/kg is an EcoSSL and is based on a geometric mean of the effective concentration to 10% of the test population (EC₁₀) and maximum acceptable toxicant concentration values from three different studies. The springtail (*Folsomia candida*) and nematode were studied for reproductive and population effects. The individual toxicity values ranged from 35 mg/kg to 355 mg/kg, but the geometric mean was 120 mg/kg. Other studies listed in EPA (2007b) but not used in the development of the SSL list no effect levels as high as 553 mg/kg and low effect levels as low as 190 mg/kg for the earthworm. Similar to the plant data, the variability of the data suggests toxicity to soil invertebrates is difficult to assess. The applicability of the test species to the species that may occur at the Site is unknown.

The applicability of soil benchmark concentration as protective of terrestrial plants and soil invertebrates at the Site is highly uncertain and is most likely overly conservative. Figure 4 shows the portions of the site that are not available for use by ecological receptors due to industrial land use. TCEQ does not recommend the application of ecologically-based PCLs based on the plant or soil invertebrate community. As described in Section 13 of TCEQ 2017, “The ecological PCL is not directly intended to be protective of on-site receptors with limited mobility or range (e.g., plants, soil invertebrates and small rodents).” Based on the uncertainty in the plant and invertebrate benchmark, the consideration that the site has significant areas of disturbed ground and TCEQ’s recognition of the limitations of the soil benchmarks, ecologically-based PCLs protective of the terrestrial plant community and soil invertebrate are overly conservative.

7.3.2 Toxicity Data Selection

Literature values were not available to evaluate the toxicity of COPCs for all receptor species, especially the VOCs. An attempt was made to identify studies using closely related species as surrogates to make risk estimates for the selected receptors. Species respond differently to exposures to toxicants. Responses to COPC exposure by indicator species may be different from species for which toxicity data were reported. Direction and magnitude of this uncertainty are not measurable, although the choice of conservative TRVs when multiple studies were available tends to skew the evaluation toward more protective conclusions.

Lead TRVs – TRVs are designed to be conservative estimates of potential toxicity based on a variety of measurement endpoints for various ecological receptors, typically in a laboratory setting using standard species that are commercially available. In the initial phase of the SLERA, NOAEL-based TRVs are used while in the less-conservative HQ calculation LOAEL-based TRVs are used. It is important to evaluate the adequacy and validity of the TRV during the SLERA process since sometimes the conservatism built into the TRV-derivation process limits the usefulness of the value. For example, the avian TRV for lead results in an Eco-SSL that is near background levels of lead. This is discussed by USEPA (2005a): “The eco SSL for avian wildlife

is however lower than the 50th percentile for reported background concentrations in eastern and western U.S. soils.” If the data used in the evaluation (EPA, 2005a) are inspected closer, the tremendous variability in the numerous studies and the conservative assumptions used to select the TRV result in a value that is not representative of the majority of the NOAELs for the compound. Again, using lead as an example, the range of TRVs looking at all NOAEL endpoints and species is from 0.0584 mg/kg-day to 304 mg/kg-day, which is a 10,000-fold difference. Often the geometric mean of the dataset is used to estimate the TRV but, in the case of lead, the lowest LOAEL value was lower than the geometric mean for the NOAEL (10.9 mg/kg-day) so the NOAEL-based TRV was set at a lower value which was more than 1/10th of the geometric mean. It should be noted that the range of LOAELs were highly variable as well, from 0.111 to 625 mg/kg-day, and the LOAEL-based TRV used in this risk assessment of 3.6 mg/kg-day is lower than the geometric mean of the NOAELs. Because the TRV is very influential in the calculation of HQs, it is important to evaluate sources of uncertainty and variability in these values. It is likely that the conservative nature of the TRV selected for use in the SLERA overestimates potential risk to birds and mammals.

7.3.3 Lack of Toxicity Data and Use of Surrogate Representatives

Toxicity data were not available for a number of constituents. Unavailable or limited toxicity data could cause underestimation of risk. Chemical surrogates were assigned, as noted in Appendix B, when possible. Below is a list of surrogates used in the initial screening assessment. Table D-4 lists when a surrogate was used for the TRV. The analytes for which ecological screening values were not available are not considered bioaccumulative or ecologically significant and although surrogate were assigned when possible, the lack of screening values or use of surrogates does not result in high uncertainty in the SLERA.

Surrogate Assignments for Missing Toxicity Data

Analyte	Surrogate for Screening (Tables 1-15)
1,2,4-Trimethylbenzene	Benzene (soil and sediment)
1,3,5-Trimethylbenzene	Benzene (soil and water) and 1,2,4-trimethylbenzene in sediment
Isopropylbenzene	Benzene (soil, sediment, and water)
Carbon Disulfide	Benzene (sediment)
Cyclohexane	Benzene (soil, sediment, and water)
Methylcyclohexane	Benzene (soil, sediment, and water)
n-butylbenzene	Benzene (soil and water)
n-propylbenzene	Benzene (soil, sediment, and water)
sec-butylbenzene	Benzene (water)
tert-butylbenzene	Benzene (water)
1-Methylnaphthalene	2-Methylnaphthalene (soil and sediment)
2,4-Dichlorophenol	Phenol (water)
2,4-Dimethylphenol	Phenol (water)

Analyte	Surrogate for Screening (Tables 1-15)
2,6-Dinitrotoluene	2,4-Dinitrotoluene (sediment)
Acetophenone	Dimethyl phthalate (sediment and water)
Benzaldehyde	Benzene (soil, sediment, and water)
Benzo(b)fluoranthene	Benzo(k)fluoranthene (sediment and water)
Caprolactam	Benzene (soil and sediment)
Carbazole	Naphthalene (soil, sediment, and water)
Dibenzofuran	Naphthalene (soil and sediment)

From the results of the SLERA, toxicity potential of most constituents with unavailable avian toxicity was represented in the SLERA by mammalian species for which toxicity data were available (i.e., benzaldehyde, cyclohexane, methylcyclohexane and carbon disulfide – See Table D-4). Therefore, the uncertainty that risk has been appreciably underestimated due to the lack of avian toxicity data for several constituents is acceptable because those constituents had available mammalian toxicity data.

There were six COPCs detected in the freshwater sediment (barium, beryllium, selenium, thallium, vanadium, and cyanide) and four COPCs detected in the marine sediment (beryllium, thallium, endosulfan sulfate, and cyanide) that did not have benthic benchmarks or PCLs. These COPCs were assessed for exposure and risk to wildlife receptors. The lack of screening values does not imply risk; it is simply that the research has not be published. It is unlikely that these COPCs would have an unacceptable risk that has not been identified through the risk process. For example, endosulfan sulfate was detected in 2 out of 22 sediment samples in the northern portion of the ditch and in 1 out of 9 in surface water samples, but at a concentration well below the marine surface water criteria. It was not detected in upstream surface water or sediment from the southern portion of the ditch. It was detected in 1 out of 54 samples in the North Pit soil, but at a concentration below the EPA Region 5 screening value. A NOAEL-based HQ of 70 was estimated for the snowy egret, using the maximum detection since there were not sufficient number of detections to calculate a 95% UCL. When all the various factors are considered it is unlikely that a lack of a benthic invertebrate screening value has contributed to an incomplete assessment of the risk to the ecosystem in the northern portion of the East Ditch.

7.3.4 Simultaneous Exposure to Multiple Constituents

Another source of uncertainty originated from the use of toxicity values reported in the open literature derived from single-species, single-constituent laboratory studies. Prediction of ecosystem effects from laboratory studies is difficult. Laboratory studies cannot take into account the effects of environmental factors that may add to the effects of chemical stress. Without exception, TRVs were selected from studies using single-constituent exposure scenarios. The endpoint species selected to represent the wildlife expected to occur within the exposure area were exposed to a variety of constituents, and it is not known whether the individual constituents in this mixture are synergistic, additive, or antagonistic. Therefore, the magnitude of this uncertainty is

not measurable and risk could be underestimated. Interactive effects were also not addressed and this could increase or decrease risk.

7.3.5 Bioavailability and Absorption

The bioavailability and absorption of all of the COPCs was assumed to be 100%. There were no adjustment factors to account for COPCs binding onto soil particles or for being present in a form that is not biologically available or active. Assumption of 100% bioavailability of COPCs results in the overestimation of risk in this SLERA. The following is a summary of the scientific literature on the bioavailability for metals.

Barium – In nature, barium occurs in a combined state, the principal forms being barium sulfate and barium carbonate. The solubility and mobility of barium is greater in sandy soil increasing with decreased pH and decreased organic matter content. Barium can react with metal oxides and hydroxides in soils, thus limiting its mobility and increasing adsorption. Barium mobility decreases in soils with high sulfate and calcium carbonate content. In biological organisms, barium possesses chemical and physiological properties that allow it to compete with and replace calcium. The uptake factors used in development of the EPA Eco-SSLs are 0.156 for plants, 0.091 for earthworms and 0.0075 for mammals indicating limited bioaccumulation (USEPA, 2005b). In aquatic media, barium is likely to precipitate out of solution as in insoluble salt (barium sulfate or barium carbonate). Waterborne barium may also adsorb to suspended particulate matter. Barium also forms complexes with natural organics in water (ATSDR, 2007).

Cadmium – Cadmium in soil can be found in sparingly soluble forms like sulfides to moderately soluble sulfates to highly soluble carbonates. Cadmium in weathered soil was evaluated *in vivo* in rats (Schoof and Freeman 1995; PTI 1994). Bioavailability was estimated at 33%. In mammals, cadmium absorption from the gastrointestinal tract is less than 10% (Irwin et al. 1997).

Chromium – In soil, the predominant form of chromium released from anthropogenic sources is hexavalent soluble chromium. The solubility and mobility of trivalent chromium is minimal, whereas hexavalent chromium is both highly soluble and mobile. Interconversion of hexavalent and trivalent chromium occurs in soils. The relative concentrations of trivalent and hexavalent chromium in a soil is dependent upon the soil reduction-oxidation (redox) conditions and geochemistry, particularly the pH and presence of oxidizing or reducing agents. However, chromium will be present in soils predominantly in the trivalent chromium oxidation state and in immobilized forms (ASTDR, 2012). As discussed in the data usability section, analytical data for the Site demonstrate that the soils and sediments are reducing, thus hexavalent chromium concentrations are expected to be very low.

Witmer et al. (1991) reported the bioavailability of environmental soil chromium, a mixture of trivalent and hexavalent chromium, by laboratory animals suggested limited oral absorption. NFESC (2000) reported trivalent chromium oral absorption as extremely low (approximately 1%)

and hexavalent chromium oral absorption at approximately 10%. Absorption of chromium is estimated to be only a few percent in birds (Irwin et al., 1997).

Lead - The soil matrix can adsorb lead or promote lead mineral formation when lead concentrations are above mineral saturation, indices greatly affecting lead oral bioavailability. Lead typically exhibits adsorption as a function of pH on soil minerals and soil organic matter. Thus, at a low pH, lead adsorption is limited (more in solution), adsorption sharply increases between pH 5 to 7, and maximum adsorption occurs beyond pH 7. Under gut conditions, both mineral and adsorbed forms of lead can be released into the gastrointestinal solution as freely dissolved ions (in addition to other elements in the matrix) because of the acidic conditions. Upon transfer to the intestinal tract, where pH is higher, the precipitation of amorphous oxide minerals may promote readsorption of lead to those minerals, which in turn limits absorption into the body (ITRC, 2017). Sample et al (2014) lists lead bioaccessibility (e.g., soluble or available fraction) ranges from 0.14% for plants to 77% for earthworms. Differences may be due to different speciation states of lead in the earthworm or plant tissue as compared to the mineral present in soil.

Mercury – Organic mercury is more readily absorbed than are inorganic forms (ASTDR, 1999). The predominant form of mercury in contaminated soil is either elemental mercury or inorganic mercury compounds (NFESC, 2000). The availability of soil mercury to plants is low and there is a root barrier to translocation of mercury to plant tops (Irwin et al., 1997).

In mammals, elemental mercury is very poorly absorbed from the gastrointestinal tract, probably less than 0.01% (Irwin et al., 1997). Kostial et al. (1978) found adult mice absorbed only 1% mercuric chloride in standard diets. Sheppard et al. (1995) conducted a study that suggests that the presence of soil alone decreases the oral bioavailability of inorganic mercury compounds. Soil sulfide is a site-specific factor that can limit the bioavailability and toxicity of mercury. Mercuric ion, Hg (II), combines with sulfide to form a very insoluble precipitate (mercuric sulfide) that strongly adsorbs to soil (National Research Council [NRC], 2000). Several studies suggest that the bioavailability of mercuric sulfide in animals is less than that of mercuric chloride (ATSDR 1999; NRC 2000).

Selenium - Selenium is unusual relative to most other metals and metalloids in that many inorganic and organic forms occur in the environment, and each form is differentially bioavailable and toxic to organisms. The selenium forms present in an aquatic system are driven by the biogeochemical cycling of selenium that is strongly controlled by site-specific environmental factors such as redox, pH, and biological productivity. Reduction of inorganic selenium species tends to immobilize selenium in an aquatic system, while other processes, such as oxidation and biotransformation, tend to make selenium bioavailable to aquatic organisms. Biological mechanisms such as uptake of sediment selenium by rooted plants, benthic invertebrates, and detritus-eating invertebrates, can act to remobilize selenium into the aquatic food web (DeForest et al., 1999). The absorptive pathways have not yet been fully characterized, but selenium as selenate or selenite appears to be

very well absorbed but less well retained in the body than organic forms of selenium, such as selenomethionine and selenocysteine (Fairweather-Tait et al, 2010). However, even though the bioavailability of selenium is high, animals can regulate the amount of selenium in their bodies and it is quickly excreted (Exponent, 2009).

Zinc – Earthworms concentrate zinc from the soil presenting a potential for hazard to birds feeding on worms, like the American robin. About 50% of zinc is absorbed from the gastrointestinal tract of mammals (Irwin et al., 1997).

7.3.6 Metabolism of PAHs in Vertebrates (Birds and Mammals)

Physiological functions may predispose an organism to accumulate environmental chemicals. Biological processes such as depuration, detoxification, and other biotransformation mechanisms affect the potential for bioaccumulation. These physiological and biochemical functions were not incorporated into the food chain analysis using published accumulation factors, and they are important functions to consider when conducting analyses of risk to wildlife as a result of exposure to PAHs. Laboratory and field studies indicate that although PAHs are lipophilic, they do not tend to be accumulated at high concentrations in higher trophic level vertebrates, as the compounds are rapidly metabolized (Douben, 2003). USEPA (2007a) states “due to rapid metabolism of PAHs after ingestion by birds and mammals, bioaccumulation is expected to be minimal.” Virtually all vertebrates have some form of xenobiotic-metabolizing enzyme system that can convert large nonpolar compounds to polar metabolites, which can, in turn, be more readily excreted. PAHs are mainly metabolized by the cytochrome P450 system, but they can also undergo metabolism by a variety of other enzymes. All of these metabolic pathways result in removal of the parent PAH compound, either via biliary or urinary excretion or via macromolecular binding of a highly reactive intermediate species, thereby limiting the biotransfer through the food chain (Hofelt et al., 2001).

7.4 Uncertainty with Risk Characterization

The risk characterization process incorporates uncertainties that may overestimate risk, especially at the screening level. Risk estimation utilizes the results of the exposure assessment and effects assessment to generate ecological HQ values. The exceedance of a screening level or HQ of 1 does not necessarily mean that there is a threat to the referenced receptor. It means only that the potential for adverse effects may exist, but the likelihood of overestimating or underestimating risk may be further explored to gain a better understanding of the confidence placed in the assumptions (exposure and effects) used to calculate risk.

Additional ecological risk evaluation is not warranted for this Site for the following reasons:

- The waste material is subsurface (> 3-feet bgs) and is not contributing to ecological risk in the surface soils over the South Pit.

- The COPCs detected in the riparian soil samples do not indicate that COPCs associated with the waste material are migrating to the East Ditch.
- Exposure to subsurface soil (> 0.5 and < 2-feet bgs) is unlikely because of the nature of the soils in the area. These soils are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and an underlying clayey silt. Approximately 90% of the North Pit area boring logs and approximately 80% of the South Pit area boring logs described gravel and/or caliche within the top two feet. The lots were improved with 6 to 12 inches of caliche base and portions were paved with hot asphalt mix (Goldston, 2010).
- However, COPC concentrations in areas of the Site exceed the community receptor benchmarks by an order of magnitude or more. Examples of these areas are shown in Figure 8. These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a transport pathway to sediments. Additional discussion in the RI report and evaluation in the feasibility study is recommended.
- Multiple COPCs retained for evaluation through the less conservative analysis which do not have benthic screening criteria or PCLs. Due to the uncertainty with plant and benthic benchmarks, these analytes were not retained as final COPCs (Table 42).
- Barium and heptachlor are final COPCs for benthic invertebrates in the marine (north) segment of the East Ditch. Heptachlor has a low detection frequency of 2 out of 22 samples.
- There are no final COPCs for the snowy egret or raccoon in the freshwater (south) segment of the East Ditch.
- There are no final COPCs for the snowy egret and raccoon in the marine (north) segment of the East Ditch. The NOAEL HQ for endosulfan sulfate is 70 for the snowy egret. Endosulfan sulfate has a low detection frequency in that it was detected in 2 of 22 samples. In addition, the maximum concentration for endosulfan sulfate in the north segment of the East Ditch (0.023 mg/kg) is slightly lower than the maximum concentration in the Up River Road drainage ditch (0.028 mg/kg).

8.0 TROPIC ANALYSIS SCIENTIFIC MANAGEMENT DECISION POINT (STEP 3A)

The SMDP is the point during the process when the risk assessor communicates results of the assessment to a risk manager. The risk manager determines whether the information is sufficient to arrive at a decision regarding risk management strategies and/or the need for additional information to characterize risk (USEPA, 1997). A SMDP occurs at the end of Step 3a to determine whether additional steps in the ecological risk assessment process are warranted. The following three options for a decision are considered at the Step 3a SMDP (USEPA, 1997):

- There is adequate information to conclude that ecological risks are negligible and therefore no need for remediation on the basis of ecological risk. The trophic analysis indicates that risks are negligible by showing HQs < 1 or development of an adequate weight of evidence presentation.
- The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3b.
- The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

These considerations are appropriate for the Step 3a SMDP because they are consistent with USEPA (2001, pages 5 and 6) guidance for screening of COPCs where it is generally stated that Step 3a can be linked to the Step 2 SMDP where:

- (1) refinement of COPCs, which may determine that some or all chemicals do not warrant being retained for further evaluation (i.e., “there is adequate information to conclude that ecological risks are negligible and therefore no need for remediation on the basis of ecological risk”);
- (2) the information is not adequate or indicates a potential for adverse ecological effects, and a more thorough assessment is warranted (proceeding to Step 3b is warranted); and
- (3) decisions can be made to terminate the ecological risk assessment and proceed with remediation for any particular part of the site and environmental medium.

8.1 Step 3A SMDP Recommendation

The Brine Cooperating Parties’ recommendation for the Step 3a SMDP is that there is adequate information to make a conclusion for the ecological risks and therefore there is no need for a Site-specific ecological risk assessment.

8.2 Resolution of Decision Statements

The decision statements listed below were developed as part of the DQO planning process conducted during the development of the RI/FS Work Plan (URS, 2010).

1. Determine whether COPC concentrations in surface soils exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or

whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the on-Site surface soils require No Further Action.

2. Determine whether COPC concentrations in East Ditch sediments exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the sediments require No Further Action.
3. Determine whether COPC concentrations in East Ditch surface water exceed site-specific risk-based ecological criteria and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the surface water require No Further Action.
4. Determine where COPC concentrations in East Ditch surface water exceed applicable state and federal water quality standards and warrant additional investigation or an evaluation in the FS, or whether COPC concentrations are equal to or less than applicable state and federal water quality standards and the surface water require No Further Action.
5. Determine whether COPC concentrations in groundwater discharging to surface water exceed site-specific risk-based ecological criteria and warrant off-Site assessment or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific ecological criteria and require No Further Action.
6. Determine whether COPC concentrations in groundwater discharging to surface water exceed applicable state and federal surface water quality standards and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than applicable state and federal water quality standards and the groundwater require No Further Action.

8.2.1 Surface Soil

One decision statement was developed for soil:

1. Determine whether COPC concentrations in surface soils exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the on-Site surface soils require No Further Action.

COPC concentrations in surface soil exceed site-specific risk-based criteria. Final COPCs are summarized below:

Final Terrestrial COPCs

South Pit Terrestrial Soil		North Pit Terrestrial Soil	
Community	Wildlife	Community	Wildlife
Mercury	Lead	Barium	Barium
Zinc	Zinc	Lead	Cadmium
	4,4'-DDT	Mercury	Lead
		Selenium	Selenium
		Zinc	Zinc

The risk evaluation was completed for the South and North Pit soils, but the quality of the habitat is such that ecological exposure is extremely limited. The majority of the Site consists of a mixture of commercial/industrial facilities, including associated parking lots, and maintained (mowed) grassy areas (Figure 4). The upper two feet of soils at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt which minimizes burrowing receptors. Current and future land use is commercial/industrial.

However, COPC concentrations at some locations within the North and South Pit areas (Figure 8) exceed the community receptor benchmarks by an order of magnitude or more. These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments. These COPCs warrant an evaluation in the FS.

8.2.2 Sediment

One decision statement was developed for sediments:

1. Determine whether COPC concentrations in East Ditch sediments exceed site-specific risk-based ecological criteria and warrant additional investigations or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the sediments require No Further Action.

Media evaluated for the south segment of the East Ditch included riparian soil, sediment as soil, and sediment. Due to the perennial conditions of the marine (north) segment, the only media evaluated was sediment. COPC concentrations in riparian soil, sediment as soil, and sediment exceed site-specific risk-based criteria.

South Segment

Based on the less-conservative analysis, there are no final COPCs for riparian soil and sediment as soil in the south segment of the East Ditch (Tables 39 and 40, respectively). No COPC concentrations exceed the community receptor benchmarks by an order of magnitude or more. A No Further Action for the SMDP is recommended for the riparian soil or sediment as soil.

Table 20 shows the results of the benthic invertebrate screening for the freshwater of the East Ditch. There are no final COPCs (Table 42). gamma-Chlordane was not detected in samples collected outside the cap area.

Table 35 shows the NOAEL-based HQs for the snowy egret and raccoon. Barium and bis(2-ethylhexyl)phthalate, have NOAEL based HQs above 1. Bis(2-ethylhexyl)phthalate is not a final COC because the use of the 95% UCL as the EPC results in an HQ less than 1 for both the raccoon and snowy egret. Following the area use factor adjustment, the NOAEL-based HQ for barium are below 1 for both receptors. There are no final COPCs for the snowy egret or raccoon in the freshwater (south) segment of the East Ditch.

A No Further Action for the SMDP is recommended for the south segment of the East Ditch.

North Segment

Table 42 summarizes the final COPCs for the North portion of the East Ditch. Barium is the final COPCs for benthic invertebrates in the marine (north) segment of the East Ditch.

Table 36 shows the NOAEL-based HQs for the snowy egret and raccoon and shows the NOAEL-based HQs for the snowy egret and the NOAEL and LOAEL-based HQs for the raccoon. In the less-conservative assessment, a home range factor for the raccoon and snowy egret was applied to the exposure calculations. Following the area use factor adjustment, the HQs are all below 1 except for the NOAEL-based HQ for endosulfan sulfate for the snowy egret. The final COPC for the snowy egret is endosulfan sulfate and there are no final COPCs for the raccoon in the marine (north) segment of the East Ditch. Endosulfan sulfate has a low detection frequency in that it was detected in 2 of 22 samples (Figure 9). In addition, the maximum concentration for endosulfan sulfate in the north segment of the East Ditch (0.023 mg/kg) is slightly lower than the maximum concentration in the Up River Road drainage ditch (0.028 mg/kg). Endosulfan sulfate is not designated as a final COPC (Table 42).

A No Further Action for the SMDP is recommended for the north segment of the East Ditch.

8.2.3 Surface Water

Two decision statements were developed for surface water:

1. Determine whether COPC concentrations in East Ditch surface water exceed site-specific risk-based ecological criteria and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific risk-based ecological criteria and the surface water require No Further Action.
2. Determine where COPC concentrations in East Ditch surface water exceed applicable state and federal water quality standards and warrant additional investigation or an evaluation in the FS, or whether COPC concentrations are equal to or less than applicable state and federal water quality standards and the surface water require No Further Action.

Table 19 summarizes the surface water evaluation for the south segment of the East Ditch using freshwater acute surface water quality standards. Aluminum was eliminated as a final COPC (Table 42) since the geometric mean of the south segment surface water concentrations of 0.60 mg/L is less than the Texas water quality standard of 0.991 mg/L (30 TAC 307 Table 1).

Table 23 summarizes the surface water evaluation for the north segment of the East Ditch using marine chronic surface water quality standards. Organochlorine pesticides were detected at concentrations greater than the screening values (4,4'-DDT, alpha-chlordane, heptachlor, heptachlor epoxide, and methoxychlor). Aluminum, cobalt and manganese are detected at concentrations that exceed the chronic criteria, however there are no Texas water quality standards for the protection of aquatic receptors for these COPCs (30 TAC 307 Table 1). The aluminum and manganese screening criteria have a high degree of uncertainty (Section 7.3.1). The cobalt screening standard used in this SLERA is a NOAA SQuRT value based on Australian & New Zealand criteria. Due to uncertainties in benchmarks, these COPCs are not retained as COPCs for risk to water column receptors. The organochlorine pesticides beta-BHC, delta-BHC, and endrin aldehyde do not have Texas water quality standards and are not retained as final COPCs. The table below compares the upstream and Up River Road surface water concentrations to the north segment concentrations and to the Texas surface water quality standards (30 TAC 307 Table 1).

COPC	Texas Surface Water Quality Standard (mg/L)	Upstream/Background (mg/L)	North Segment (mg/L)	Up River Road (mg/L)
4,4'-DDT	0.000001	0.000054 J	0.000048	0.0000094 J
alpha-Chlordane	0.000004	< 0.000012	0.0000075	< 0.0000025
Heptachlor	0.000004	0.0000018 J	0.000014	0.0000032 J
Methoxychlor	0.00003	< 0.00012	0.000056	< 0.000012

4,4'-DDT occurs in either the upstream surface water or the Up River Road surface water at concentrations exceeding the Texas surface water quality standards. Heptachlor was detected in five of the nine surface water samples collected in the North portion of the East Ditch. Two of the five detections are at concentrations greater than the chronic Texas Surface Water Quality Standard. Heptachlor was also detected in one upstream/background sample and in Up River Road (three out of five) samples, but at concentrations slightly less than what was detected in the North Segment. Methoxychlor and alpha-chlordane were only detected in one of the nine samples collected in the north segment.

8.2.4 Groundwater to Surface Water Pathway

Two decision statements were developed for the groundwater to surface water pathway:

1. Determine whether COPC concentrations in groundwater discharging to surface water exceed site-specific risk-based ecological criteria and warrant off-Site assessment or an evaluation in the FS, or whether the COPC concentrations are equal to or less than site-specific ecological criteria and require No Further Action.

2. Determine whether COPC concentrations in groundwater discharging to surface water exceed applicable state and federal surface water quality standards and warrant additional investigation or an evaluation in the FS, or whether the COPC concentrations are equal to or less than applicable state and federal water quality standards and the groundwater require No Further Action.

Table 25 lists the analytes detected at concentrations greater than the screening-levels or detected and considered bioaccumulative for evaluation of the groundwater to surface water prior to installation of the sediment cap (Figure 5). Since the construction of the sediment cap renders the groundwater-to-surface water pathway incomplete in the south segment of the East Ditch, no final COPCs for groundwater are designated. As discussed in Section 4.3.2 and shown on Table 26, all representative concentrations for the groundwater to surface water pathway in the north segment of the East Ditch are below their respective Tier 2 surface water criteria (^{SW}GW).

9.0 RISK MANAGEMENT RECOMMENDATION

Ecological exposures are greatly influenced by the lack of viable and diverse habitat at the Site. Based on the conservative modeling completed in the SLERA, final trophic COPCs for the South Pit include lead, zinc and 4,4'-DDT. Final trophic COPCs for the North Pit include barium, cadmium, lead, selenium, and zinc. The lots were paved with compacted caliche and hot mix asphalt during the industrial development of the Site after the purchase by The Goldston Company in 1974 (Goldston, 2002; 2004). The area is mowed and maintained and the upper two feet of soils at the Site are generally comprised of a thin layer of topsoil (up to 6 inches) with a caliche (calcium carbonate with gravel, sand, clay, and silt binders) and gravel fill and underlying clayey silt. Approximately 40% of the North Pit and South Pit areas are covered by buildings or non-vegetative cover such as asphalt or caliche base (Figure 4). In addition, approximately 75% of the surface of Lot 6 is a lay-down area that is covered by equipment and other materials. Because of the soil type, anthropogenic activities, and current and future commercial/industrial land development (Appendix A-1), the use of the North and South Pit areas as quality terrestrial habitat is limited. The nature of the habitat limits the exposure and therefore the ecological risk management recommendation is no further ecological action and no development of ecologically based clean up goals for the terrestrial upland soils.

However, some COPC concentrations at some locations within the North and South Pit areas (Figure 8) exceed the community receptor benchmarks by an order of magnitude or more (Table 42). These locations present a potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments. These final COPCs for the South Pit are mercury and zinc and for the North Pit are barium, lead, mercury, selenium, and zinc. These COPCs warrant an evaluation in the FS.

The south segment of the East Ditch is an intermittent stream and there is significant uncertainty with the determination of final COPCs. Between November and December 2017, a sediment cap was installed in the south segment of the East Ditch (Figure 5). An evaluation of the dataset for locations outside the cap area results in no final community and wildlife COPCs (Table 42). The HQ values were below 10. A No Further Action SMDP is recommended for the south segment of the East Ditch.

For the north segment of the East Ditch there are no groundwater final COPCs, but there are surface water COPCs (4,4'-DDT, alpha-chlordane, heptachlor, and methoxychlor) and a sediment COPC (barium) (Table 42). As discussed in Section 8.2.3, there can be inputs from Up River Road or upstream for the surface water pesticides. The trophic analysis showed endosulfan sulfate as the final COPC for the snowy egret. This species represents special status bird species. These assumptions are likely overly conservative. Endosulfan sulfate has a low detection frequency in that it was detected in 2 of 22 samples. In addition, the maximum concentration for endosulfan sulfate in the north segment of the East Ditch (0.023 mg/kg) is slightly lower than the maximum concentration in the Up River Road drainage ditch (0.028 mg/kg). Endosulfan sulfate was

eliminated as a final COPC in the less-conservative analysis. A No Further Action SMDP is recommended for the south segment of the East Ditch.

The Step 3a evaluation does not account for mitigating factors such as poor soil, bioavailability, lack of habitat on-Site, amount of time that the southern portion of the ditch is wet or day and available quality habitat nearby. Further evaluation of the Brine Service Company Superfund Site for ecological risks is not warranted.

The SLERA evaluation (Steps 1, 2, and 3a) of the ecological risk assessment process is complete for the Brine Service Company Superfund Site. This SLERA presents the data for the process and concludes that additional assessment of ecological exposures of COPCs in sediment, surface water and soil at the Site is not warranted. This conclusion is based on the risks to the soil (plant or invertebrate) communities and to upper trophic level receptors. As described in Section 13.1 of the Ecological Risk Assessment guidance (TCEQ, 2017a) “The ecological PCL is not directly intended to be protective of on-site receptors with limited mobility or range (e.g., plants, soil invertebrates and small rodents))....” Based on the limitations of the soil benchmarks for receptors with limited mobility or range and the overall low HQs, further evaluation of ecological risk to the plant or invertebrate communities and to upper trophic level receptors is not warranted. The poor habitat quality and industrial nature limit any ecological exposures.

The final SMDP recommendation for the Site, based on potential acute risk to community receptors, or depending on proximity to ditch, a potential transport pathway to sediments, is the evaluation of terrestrial COPCs, barium, lead, mercury, selenium, and zinc, in the FS.

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Table 1
Summary of Detected and Non-Detected Constituents for the South Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated	
SW6020	Aluminum	7429-90-5	No	19500	110	mg/kg	SPSB02-010-120210	55 / 55	NA	NA	NA	NA	Eliminated; average soil pH 8.74	
SW6020	Antimony	7440-36-0	No	1.06	2.8	mg/kg	SPSB06-010-120310	7 / 55	5	ORNL Plants	0	0.21	Eliminated HQ < 1	
SW6020	Arsenic	7440-38-2	No	14.4	0.66	mg/kg	ESSB04-010-110510	57 / 57	18	Eco SSL Plants	0	0.80	Eliminated HQ < 1	
SW6020	Barium	7440-39-3	No	2220	42	mg/kg	SPSB06-010-120310	55 / 55	330	Eco SSL Earthworms	25	6.7	Retained HQ > 1	
SW6020	Beryllium	7440-41-7	No	0.992	0.55	mg/kg	WSB04-010-110210	54 / 55	10	ORNL Plants	0	0.10	Eliminated HQ < 1	
SW6020	Cadmium	7440-43-9	Yes	19.6	0.44	mg/kg	SPSB08-010-120110	52 / 55	32	Eco SSL Plants	0	0.61	Retained detected bioaccumulative	
SW6020	Chromium	7440-47-3	Yes	234	5	mg/kg	ESSB03-010-FD-120910	55 / 55	0.4	ORNL Earthworms	55	585	Retained detected bioaccumulative; HQ>1	
SW6020	Cobalt	7440-48-4	No	8.61	0.33	mg/kg	ESSB03-010-120910	55 / 55	13	Eco SSL Plants	0	0.66	Eliminated HQ < 1	
SW6020	Copper	7440-50-8	Yes	234	14	mg/kg	ESSB04-010-110510	55 / 55	70	Eco SSL Plants	6	3.3	Retained detected bioaccumulative; HQ>1	
SW6020	Lead	7439-92-1	Yes	359	5.6	mg/kg	SPSB08-010-120110	55 / 55	120	Eco SSL Plants	12	3.0	Retained detected bioaccumulative; HQ>1	
SW6020	Manganese	7439-96-5	No	490	11	mg/kg	SPSS06-000-101310	55 / 55	220	Eco SSL Plants	23	2.2	Retained HQ > 1	
SW6020	Nickel	7440-02-0	Yes	60.1	0.66	mg/kg	SPSB08-010-120110	55 / 55	30	Eco SSL Plants	1	2.0	Retained detected bioaccumulative; HQ>1	
SW6020	Selenium	7782-49-2	Yes	3.77	2.8	mg/kg	ESSB06-010-110310	42 / 55	0.52	Eco SSL Plants	31	7.3	Retained detected bioaccumulative; HQ>1	
SW6020	Silver	7440-22-4	Yes	1.6	0.44	mg/kg	SPSB08-010-120110	24 / 55	560	Eco SSL Plants	0	0.0029	Retained detected bioaccumulative	
SW6020	Thallium	7440-28-0	No	0.37	J	0.77	mg/kg	WSB04-010-110210	32 / 55	1.0	ORNL Plants	0	0.37	Eliminated HQ < 1
SW6020	Vanadium	7440-62-2	No	27.7	0.77	mg/kg	ESSB03-010-120910	55 / 55	2.0	ORNL Plants	55	14	Retained HQ > 1	
SW6020	Zinc	7440-66-6	Yes	2700	250	mg/kg	SPSS05-000-101410	55 / 55	120	Eco SSL Earthworms	21	23	Retained detected bioaccumulative; HQ>1	
SW7471	Mercury	7439-97-6	Yes	23	0.024	mg/kg	ESSB06-010-110310	57 / 57	0.10	ORNL Earthworms	23	230	Retained detected bioaccumulative; HQ>1	
SW8081	4,4'-DDD	72-54-8	Yes	0.11	J	0.064	mg/kg	ESSS03-000-101210	12 / 55	0.758	EPA Region V Mammals	0	0.15	Retained detected bioaccumulative
SW8081	4,4'-DDE	72-55-9	Yes	0.033	J	0.064	mg/kg	ESSS03-000-101210	2 / 55	0.596	EPA Region V Mammals	0	0.055	Retained detected bioaccumulative
SW8081	4,4'-DDT	50-29-3	Yes	0.088	0.064	mg/kg	SPSB09-010-FD-113010	13 / 55	0.021	Eco SSL Mammals	9	4.2	Retained detected bioaccumulative; HQ>1	
SW8081	Aldrin	309-00-2	Yes	ND	0.038	mg/kg	ND	0 / 55	0.00332	EPA Region V Plants	ND	ND	Eliminated; not detected	
SW8081	alpha-BHC	319-84-6	Yes	ND	0.038	mg/kg	ND	0 / 55	0.0994	EPA Region V Plants	ND	ND	Eliminated; not detected	
SW8081	alpha-Chlordane	5103-71-9	Yes	0.25	J	0.026	mg/kg	SPSB10-010-113010	6 / 55	0.224	ORNL Plants	1	1.1	Retained detected bioaccumulative; HQ>1
SW8081	beta-BHC	319-85-7	Yes	0.23	0.038	mg/kg	ESSS03-000-101210	5 / 55	0.00398	EPA Region V Plants	5	58	Retained detected bioaccumulative; HQ>1	
SW8081	delta-BHC	319-86-8	Yes	ND	0.026	mg/kg	ND	0 / 55	9.94	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8081	Dieldrin	60-57-1	Yes	0.057	J	0.064	mg/kg	ESSS03-000-101210	3 / 55	0.0049	Eco SSL Mammals	2	12	Retained detected bioaccumulative; HQ>1
SW8081	Endosulfan I	959-98-8	No	0.027	J	0.038	mg/kg	ESSS03-000-101210	3 / 55	0.119	EPA Region V Mammals	0	0.23	Eliminated HQ < 1
SW8081	Endosulfan II	33213-65-9	No	0.024	J	0.077	mg/kg	ESSS03-000-101210	2 / 55	0.119	EPA Region V Mammals	0	0.20	Eliminated HQ < 1
SW8081	Endosulfan sulfate	1031-07-8	No	0.032	J	0.077	mg/kg	ESSS03-000-101210/ ESSB03-010-FD-120910	3 / 55	0.0358	EPA Region V Mammals	0	0.89	Eliminated HQ < 1
SW8081	Endrin	72-20-8	Yes	0.038	J	0.077	mg/kg	SPSB06-010-120310	2 / 55	0.0101	EPA Region V Mammals	2	3.8	Retained detected bioaccumulative; HQ>1
SW8081	Endrin aldehyde	7421-93-4	Yes	0.1	J	0.077	mg/kg	ESSS03-000-101210	3 / 55	0.0105	EPA Region V Mammals	3	9.5	Retained detected bioaccumulative; HQ>1
SW8081	gamma-BHC	58-89-9	Yes	0.013	J	0.026	mg/kg	ESSS03-000-101210	1 / 55	0.005	EPA Region V Plants	1	2.6	Retained detected bioaccumulative; HQ>1
SW8081	gamma-Chlordane	5103-74-2	Yes	0.31	0.026	mg/kg	SPSB10-010-113010	12 / 55	0.224	EPA Region V Plants	1	1.4	Retained detected bioaccumulative; HQ>1	
SW8081	Heptachlor	76-44-8	Yes	0.069	0.038	mg/kg	SPSB10-010-113010	1 / 55	0.00598	EPA Region V Mammals	1	12	Retained detected bioaccumulative; HQ>1	
SW8081	Heptachlor epoxide	1024-57-3	Yes	0.33	J	0.038	mg/kg	SPSB04-010-120210	5 / 55	0.152	EPA Region V Mammals	1	2.2	Retained detected bioaccumulative; HQ>1
SW8081	Methoxychlor	72-43-5	No	ND	0.43	mg/kg	ND	0 / 55	0.0199	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8081	Toxaphene	8001-35-2	Yes	ND	0.48	mg/kg	ND	0 / 55	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.031	mg/kg	ND	0 / 55	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.031	mg/kg	ND	0 / 55	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.031	mg/kg	ND	0 / 55	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.031	mg/kg	ND	0 / 55	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.031	mg/kg	ND	0 / 55	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1254	11097-69-1	Yes	0.36	J	0.031	mg/kg	ESSB05-010-110410	3 / 55	NA	Evaluate as Total PCBs	NA	ND	Evaluated as Total PCBs
SW8082	Aroclor 1260	11096-82-5	Yes	0.77	J	0.023	mg/kg	SPSB09-010-FD-113010	21 / 55	NA	Evaluate as Total PCBs	NA	ND	Evaluated as Total PCBs
SW8082	Total PCBs	TPCB	Yes	0.7781	0.1045	mg/kg	SPSB09-010-FD-113010	24 / 55	40	ORNL Plants	0	0.019	Retained detected bioaccumulative	
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.00077	mg/kg	ND	0 / 55	225	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.0019	mg/kg	ND	0 / 55	29.8	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.0007	mg/kg	ND	0 / 55	0.127	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.0014	mg/kg	ND	0 / 55	NA					

Table 1
Summary of Detected and Non-Detected Constituents for the South Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,3,5-Trimethylbenzene	108-67-8	No	0.0055	0.00088	mg/kg	SPSB03-010-120110	2 / 55	0.255	Surrogate - Benzene	0	0.022	Eliminated HQ < 1
SW8260	1,3-Dichlorobenzene	541-73-1	No	ND	0.00099	mg/kg	ND	0 / 55	37.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.00077	mg/kg	ND	0 / 55	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	No	0.014	0.0024	mg/kg	SPSB04-010-120210	1 / 55	89.6	EPA Region V Mammals	0	1.6E-04	Eliminated HQ < 1
SW8260	2-Hexanone	591-78-6	No	ND	0.0019	mg/kg	ND	0 / 55	12.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0014	mg/kg	ND	0 / 55	443	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	No	0.097	0.025	mg/kg	SPSB04-010-120210	2 / 55	2.5	EPA Region V Mammals	0	0.039	Eliminated HQ < 1
SW8260	Benzene	71-43-2	No	0.0022 J	0.0023	mg/kg	SPSB04-010-120210	3 / 55	0.255	EPA Region V Mammals	0	0.0086	Eliminated HQ < 1
SW8260	Bromodichloromethane	75-27-4	No	ND	0.0007	mg/kg	ND	0 / 55	0.54	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.00077	mg/kg	ND	0 / 55	15.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0014	mg/kg	ND	0 / 55	0.235	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	ND	0.0018	mg/kg	ND	0 / 55	0.0941	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.0013	mg/kg	ND	0 / 55	2.98	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.0007	mg/kg	ND	0 / 55	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0014	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.002	mg/kg	ND	0 / 55	1.19	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0014	mg/kg	ND	0 / 55	10.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.0017	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.0007	mg/kg	ND	0 / 55	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	ND	0.0013	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dibromochloromethane	124-48-1	No	ND	0.0007	mg/kg	ND	0 / 55	2.05	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.002	mg/kg	ND	0 / 55	39.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	0.006	0.00099	mg/kg	SPSB09-010-FD-113010	8 / 55	5.16	EPA Region V Mammals	0	0.0012	Eliminated HQ < 1
SW8260	Isopropylbenzene	98-82-8	No	0.0062	0.0011	mg/kg	SPSB06-010-120310	5 / 55	0.255	Surrogate - Benzene	0	0.024	Eliminated HQ < 1
SW8260	Methyl acetate	79-20-9	No	ND	0.0011	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.0021	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylocyclohexane	108-87-2	No	ND	0.0017	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylene chloride	75-09-2	No	0.0049 J	0.0028	mg/kg	ESSB11-010-010412	11 / 55	4.05	EPA Region V Mammals	0	0.0012	Eliminated HQ < 1
SW8260	Naphthalene	91-20-3	No	0.018	0.00088	mg/kg	SPSB03-010-120110	6 / 55	0.0994	EPA Region V Mammals	0	0.18	Eliminated HQ < 1
SW8260	n-Butylbenzene	104-51-8	No	ND	0.0007	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	No	0.0025 J	0.00099	mg/kg	SPSB03-010-120110	6 / 55	0.255	Surrogate - Benzene	0	0.010	Eliminated HQ < 1
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.0007	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	0.013	0.0007	mg/kg	SPSB04-010-120210	3 / 55	300	ORNL Plants	0	4.3E-05	Eliminated HQ < 1
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.0007	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.0011	mg/kg	ND	0 / 55	9.92	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	0.0024 J	0.0051	mg/kg	ESSB07-010-120810	1 / 55	200	ORNL Plants	0	1.2E-05	Eliminated HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.00099	mg/kg	ND	0 / 55	0.784	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.0007	mg/kg	ND	0 / 55	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.0018	mg/kg	ND	0 / 55	12.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.00088	mg/kg	ND	0 / 55	16.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.0011	mg/kg	ND	0 / 55	0.646	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	0.007 J	0.0029	mg/kg	ESSB03-010-FD-120910	4 / 55	10	EPA Region V Plants	0	7.0E-04	Eliminated HQ < 1
SW8270	1,1'-Biphenyl	92-52-4	No	0.75	0.18	mg/kg	ESSB03-010-120910	11 / 55	60	ORNL Plants	0	0.013	Eliminated HQ < 1
SW8270	1-Methylnaphthalene	90-12-0	No	1.1 J	0.15	mg/kg	ESSB03-010-120910	21 / 55	3.24	Surrogate - 2-Methylnaphthalene	0	0.34	Eliminated HQ < 1
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.18	mg/kg	ND	0 / 55	4.0	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.21	mg/kg	ND	0 / 55	10	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.14	mg/kg	ND	0 / 55	87.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	0.19 JL	0.21	mg/kg	SPSB06-010-120310	4 / 55	0.010	EPA Region V Plants	3	19	Retained HQ > 1
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.21	mg/kg	ND	0 / 55	20	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.21	mg/kg	ND	0 / 55	6.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.2	mg/kg	ND	0 / 55	5.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.26	mg/kg	ND	0 / 55	0.0122	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.2	mg/kg	ND	0 / 55	0.243	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L	91-57-6	No	4.8 J	0.17	mg/kg	ESSB03-010-120910	27 / 55	3.24	EPA Region V Mammals	1	1.5	Evaluated as LMW PAH
SW8270	2-Methylphenol	95-48-7	No	0.14 J	0.18	mg/kg	ESSB03-010-120910	7 / 55	40.4	EPA			

Table 1
Summary of Detected and Non-Detected Constituents for the South Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated	
SW8270	4-Bromophenyl phenyl ether	101-55-3	No	ND	0.21	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected	
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.21	mg/kg	ND	0 / 55	7.95	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	4-Chloroaniline	106-47-8	No	ND	0.14	mg/kg	ND	0 / 55	1.1	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.14	mg/kg	ND	0 / 55	NA	NA	ND	ND	Eliminated; not detected	
SW8270	4-Nitroaniline	100-01-6	No	ND	0.21	mg/kg	ND	0 / 55	21.9	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	4-Nitrophenol	100-02-7	No	ND	0.24	mg/kg	ND	0 / 55	7.0	ORNL Earthworms	ND	ND	Eliminated; not detected	
SW8270	Acenaphthene-L	83-32-9	No	0.5	0.14	mg/kg	SPSB06-010-120310	10 / 55	20	ORNL Plants	0	0.025	Evaluated as LMW PAH	
SW8270	Acenaphthylene-L	208-96-8	No	0.19	0.14	mg/kg	SPSB06-010-120310	14 / 55	682	EPA Region V Mammals	0	2.8E-04	Evaluated as LMW PAH	
SW8270	Acetophenone	98-86-2	No	6.8	J	0.15	mg/kg	ESSB03-010-120910	25 / 55	300	EPA Region V Mammals	0	0.023	Eliminated HQ < 1
SW8270	Anthracene-L	120-12-7	No	1.9	0.14	mg/kg	SPSB04-010-120210	38 / 55	1480	EPA Region V Mammals	0	0.0013	Evaluated as LMW PAH	
SW8270	Benz(a)anthracene-H	56-55-3	No	4.3	0.18	mg/kg	SPSB06-010-120310	45 / 55	5.21	EPA Region V Mammals	0	0.83	Evaluated as HMW PAH	
SW8270	Benzaldehyde	100-52-7	No	1.3	JL	0.29	mg/kg	SPSB06-010-120310	8 / 55	0.255	Surrogate - Benzene	1	5.1	Retained HQ > 1
SW8270	Benzo(a)pyrene-H	50-32-8	No	4.4	0.15	mg/kg	SPSB06-010-120310	40 / 55	1.52	EPA Region V Mammals	1	2.9	Evaluated as HMW PAH	
SW8270	Benzo(b)fluoranthene	205-99-2	No	5.6	0.21	mg/kg	SPSB06-010-120310	42 / 55	59.8	EPA Region V Mammals	0	0.094	Eliminated HQ < 1	
SW8270	Benzo(g,h,i)perylene	191-24-2	No	4.6	0.18	mg/kg	SPSB06-010-120310	39 / 55	119	EPA Region V Mammals	0	0.039	Eliminated HQ < 1	
SW8270	Benzo(k)fluoranthene	207-08-9	No	2.2	0.21	mg/kg	SPSB06-010-120310	39 / 55	148	EPA Region V Mammals	0	0.015	Eliminated HQ < 1	
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.15	mg/kg	ND	0 / 55	0.302	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.18	mg/kg	ND	0 / 55	23.7	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.17	mg/kg	ND	0 / 55	19.9	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.29	0.42	mg/kg	SPSB10-010-113010	8 / 55	0.925	EPA Region V Mammals	0	0.31	Eliminated HQ < 1	
SW8270	Butyl benzyl phthalate	85-68-7	No	0.05	J	0.16	mg/kg	SPSS02-000-101310	5 / 55	0.239	EPA Region V Mammals	0	0.21	Eliminated HQ < 1
SW8270	Caprolactam	105-60-2	No	0.0067	JL	0.15	mg/kg	ESSB15-010-030712	2 / 55	0.255	Surrogate - Benzene	0	0.026	Eliminated HQ < 1
SW8270	Carbazole	86-74-8	No	0.45	0.14	mg/kg	SPSB06-010-120310	22 / 55	0.0994	Surrogate - Naphthalene	1	4.5	Retained HQ > 1	
SW8270	Chrysene-H	218-01-9	No	4.2	0.18	mg/kg	SPSB06-010-120310	45 / 55	4.73	EPA Region V Mammals	0	0.89	Evaluated as HMW PAH	
SW8270	Dibenz(a,h)anthracene-H	53-70-3	No	1.5	0.14	mg/kg	SPSB06-010-120310	17 / 55	18.4	EPA Region V Mammals	0	0.082	Evaluated as HMW PAH	
SW8270	Dibenzofuran	132-64-9	No	0.19	0.14	mg/kg	ESSB03-010-120910	12 / 55	0.0994	Surrogate - Naphthalene	2	1.9	Retained HQ > 1	
SW8270	Diethyl phthalate	84-66-2	No	ND	0.21	mg/kg	ND	0 / 55	100	ORNL Plants	ND	ND	Eliminated; not detected	
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.15	mg/kg	ND	0 / 55	200	ORNL Earthworms	ND	ND	Eliminated; not detected	
SW8270	Di-n-butyl phthalate	84-74-2	No	0.0065	J	0.16	mg/kg	ESSS12-000-010412	1 / 55	200	ORNL Plants	0	3.3E-05	Eliminated HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	No	0.081	0.18	mg/kg	SPSB08-010-120110	2 / 55	709	EPA Region V Mammals	0	1.1E-04	Eliminated HQ < 1	
SW8270	Fluoranthene-H	206-44-0	No	8.3	0.25	mg/kg	SPSB06-010-120310	49 / 55	122	EPA Region V Mammals	0	0.068	Evaluated as HMW PAH	
SW8270	Fluorene-L	86-73-7	No	0.71	0.14	mg/kg	SPSB04-010-120210	14 / 55	30	ORNL Earthworms	0	0.024	Evaluated as LMW PAH	
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.17	mg/kg	ND	0 / 55	0.199	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.28	mg/kg	ND	0 / 55	0.0398	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.23	mg/kg	ND	0 / 55	10	ORNL Plants	ND	ND	Eliminated; not detected	
SW8270	Hexachloroethane	67-72-1	No	ND	0.25	mg/kg	ND	0 / 55	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	High Molecular Weight PAHs	HPAH	No	29.5	0.0172	mg/kg	SPSB06-010-120310	52 / 55	1.1	Eco SSL Mammals	8	27	Retained HQ > 1	
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	No	3.3	0.22	mg/kg	SPSB06-010-120310	35 / 55	109	EPA Region V Mammals	0	0.030	Eliminated HQ < 1	
SW8270	Isophorone	78-59-1	No	ND	0.19	mg/kg	ND	0 / 55	139	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	Low Molecular Weight PAHs	LPAH	No	8.291	0.0211	mg/kg	ESSB03-010-120910	52 / 55	29	Eco SSL Earthworms	0	0.29	Eliminated HQ < 1	
SW8270	Naphthalene-L	91-20-3	No	2.2	J	0.21	mg/kg	ESSB03-010-120910	17 / 55	0.0994	EPA Region V Mammals	7	22	Evaluated as LMW PAH
SW8270	Nitrobenzene	98-95-3	No	ND	0.21	mg/kg	ND	0 / 55	40	ORNL Earthworms	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.25	mg/kg	ND	0 / 55	0.544	EPA Region V Mammals	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.14	mg/kg	ND	0 / 55	20	ORNL Earthworms	ND	ND	Eliminated; not detected	
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.18	mg/kg	ND	0 / 55	5.0	Eco SSL Plants	ND	ND	Eliminated; not detected	
SW8270	Phenanthrene-L	85-01-8	No	5.2	0.19	mg/kg	SPSB06-010-120310	45 / 55	45.7	EPA Region V Mammals	0	0.11	Evaluated as LMW PAH	
SW8270	Phenol	108-95-2	No	0.17	JL	0.21	mg/kg	SPSB06-010-120310	6 / 55	30	ORNL Earthworms	0	0.0057	Eliminated HQ < 1
SW8270	Pyrene-H	129-00-0	No	6.8	0.14	mg/kg	SPSB06-010-120310	47 / 55	78.5	EPA Region V Mammals	0	0.087	Evaluated as HMW PAH	
SW9014	Cyanide	57-12-5	No	6.95	0.81	mg/kg	SPSS06-000-101310	12 / 55	1.33	EPA Region V Mammals	8	5.2	Retained HQ > 1	

This table lists all soil data (0-0.5 ft and 1-2 ft soil depths) combined for the South Pit Terrestrial exposure area and data are screened against soil benchmarks using maximum detected concentration.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

HMW PAHs, LMW PAHs and Total PCBs screened as a class and not individual constituents.

Table 17 summarizes the COPCs in soil from the South Pit exposure area for further evaluation.

L - Low Molecular Weight PAH (LMW PAH)

PCB - Polychlorinated Biphenyl

ORNL - Oak Ridge National Laboratory

Table 2
Summary of Detected and Non-Detected Constituents for the North Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	No	17800	110	mg/kg	WSS05-000-100710	54 / 54	NA	NA	NA	NA	Eliminated; average soil pH 8.74
SW6020	Antimony	7440-36-0	No	1	2.8	mg/kg	ENSS06-000-101110	13 / 54	5	ORNL Plants	0	0.20	Eliminated HQ < 1
SW6020	Arsenic	7440-38-2	No	32.3	0.68	mg/kg	NPSB07-010-110910	68 / 68	18	Eco SSL Plants	2	1.8	Retained HQ > 1
SW6020	Barium	7440-39-3	No	11800	78	mg/kg	ENSS06-000-101110	54 / 54	330	Eco SSL Earthworms	28	36	Retained HQ > 1
SW6020	Beryllium	7440-41-7	No	0.829 J	0.57	mg/kg	NPSS02-000-101310	52 / 54	10	ORNL Plants	0	0.083	Eliminated HQ < 1
SW6020	Cadmium	7440-43-9	Yes	67.2	0.45	mg/kg	NPSB07-010-110910	54 / 54	32	Eco SSL Plants	3	2.1	Retained detected bioaccumulative; HQ>1
SW6020	Chromium	7440-47-3	Yes	61.8	0.57	mg/kg	NPSS01-000-101210	54 / 54	0.4	ORNL Earthworms	54	155	Retained detected bioaccumulative; HQ>1
SW6020	Cobalt	7440-48-4	No	11.3	0.34	mg/kg	NPSB09-010-111010	54 / 54	13	Eco SSL Plants	0	0.87	Eliminated HQ < 1
SW6020	Copper	7440-50-8	Yes	475	16	mg/kg	NPSB07-010-110910	54 / 54	70	Eco SSL Plants	4	6.8	Retained detected bioaccumulative; HQ>1
SW6020	Lead	7439-92-1	Yes	1800	5.7	mg/kg	NPSS07-000-101310	54 / 54	120	Eco SSL Plants	13	15	Retained detected bioaccumulative; HQ>1
SW6020	Manganese	7439-96-5	No	584	11	mg/kg	NPSB03-010-111110	54 / 54	220	Eco SSL Plants	24	2.7	Retained HQ > 1
SW6020	Nickel	7440-02-0	Yes	15.4	0.68	mg/kg	WSS07-000-100710	54 / 54	38	Eco SSL Plants	0	0.41	Retained detected bioaccumulative
SW6020	Selenium	7782-49-2	Yes	12.8	2.8	mg/kg	ENSB07-010-120810	47 / 54	0.52	Eco SSL Plants	37	25	Retained detected bioaccumulative; HQ>1
SW6020	Silver	7440-22-4	Yes	10.2	0.45	mg/kg	NPSB07-010-110910	31 / 54	560	Eco SSL Plants	0	0.018	Retained detected bioaccumulative
SW6020	Thallium	7440-28-0	No	0.254 J	0.79	mg/kg	NPSS03-000-101210	27 / 54	1.0	ORNL Plants	0	0.25	Eliminated HQ < 1
SW6020	Vanadium	7440-62-2	No	25.4	0.79	mg/kg	NPSB03-010-111110/ WSS05-000-100710	54 / 54	2.0	ORNL Plants	54	13	Retained HQ > 1
SW6020	Zinc	7440-66-6	Yes	13700	29	mg/kg	NPSB07-010-110910	54 / 54	120	Eco SSL Earthworms	35	114	Retained detected bioaccumulative; HQ>1
SW7471	Mercury	7439-97-6	Yes	58.1	0.032	mg/kg	ESSB09-010-011012	72 / 72	0.10	ORNL Earthworms	46	581	Retained detected bioaccumulative; HQ>1
SW8081	4,4'-DDD	72-54-8	Yes	0.045 J	0.006	mg/kg	NPSS05-000-101310	1 / 54	0.758	EPA Region V Mammals	0	0.059	Retained detected bioaccumulative
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.006	mg/kg	ND	0 / 54	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	4,4'-DDT	50-29-3	Yes	0.01 J	0.006	mg/kg	NPSS05-000-101310	4 / 54	0.021	Eco SSL Mammals	0	0.48	Retained detected bioaccumulative
SW8081	Aldrin	309-00-2	Yes	0.024 J	0.0036	mg/kg	NPSS05-000-101310	1 / 54	0.0032	EPA Region V Plants	1	7.2	Retained detected bioaccumulative; HQ>1
SW8081	alpha-BHC	319-84-6	Yes	ND	0.0036	mg/kg	ND	0 / 54	0.0994	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.0024	mg/kg	ND	0 / 54	0.224	ORNL Plants	ND	ND	Eliminated; not detected
SW8081	beta-BHC	319-85-7	Yes	0.012 J	0.0036	mg/kg	NPSB05-010-111110	2 / 54	0.00398	EPA Region V Plants	1	3.0	Retained detected bioaccumulative; HQ>1
SW8081	delta-BHC	319-86-8	Yes	ND	0.0024	mg/kg	ND	0 / 54	9.94	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Dieldrin	60-57-1	Yes	ND	0.006	mg/kg	ND	0 / 54	0.0049	Eco SSL Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	No	ND	0.0036	mg/kg	ND	0 / 54	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	No	ND	0.0072	mg/kg	ND	0 / 54	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	No	0.003 J	0.0072	mg/kg	ENSB08-010-110910	1 / 54	0.0358	EPA Region V Mammals	0	0.084	Eliminated HQ < 1
SW8081	Endrin	72-20-8	Yes	0.061 J	0.0072	mg/kg	NPSS05-000-101310	2 / 54	0.0101	EPA Region V Mammals	1	6.0	Retained detected bioaccumulative; HQ>1
SW8081	Endrin aldehyde	7421-93-4	Yes	0.02	0.0072	mg/kg	ENSS07-000-101110	3 / 54	0.0105	EPA Region V Mammals	2	1.9	Retained detected bioaccumulative; HQ>1
SW8081	gamma-BHC	58-89-9	Yes	ND	0.0024	mg/kg	ND	0 / 54	0.005	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	gamma-Chlordane	5103-74-2	Yes	ND	0.0093	mg/kg	ND	0 / 54	0.224	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	Heptachlor	76-44-8	Yes	ND	0.0036	mg/kg	ND	0 / 54	0.00598	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.0036	mg/kg	ND	0 / 54	0.152	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	No	ND	0.041	mg/kg	ND	0 / 54	0.0199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	Yes	ND	0.052	mg/kg	ND	0 / 54	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.003	mg/kg	ND	0 / 54	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	Yes	0.028	0.0022	mg/kg	ENSB08-010-110910	10 / 54	NA	Evaluate as Total PCBs	NA	NA	Evaluated as Total PCBs
SW8082	Total PCBs	TPCB	Yes	0.0364	0.0101	mg/kg	ENSB08-010-110910	10 / 54	40	ORNL Plants	0	9.1E-04	Retained detected bioaccumulative
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.001	mg/kg	ND	0 / 54	225	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.0024	mg/kg	ND	0 / 54	29.8	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.00089	mg/kg	ND	0 / 54	0.127	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.0019	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.0028	mg/kg	ND	0 / 54	28.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.00089	mg/kg	ND	0 / 54	20.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260</td													

Table 2
Summary of Detected and Non-Detected Constituents for the North Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,3-Dichlorobenzene	541-73-1	No	ND	0.0013	mg/kg	ND	0 / 54	37.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.001	mg/kg	ND	0 / 54	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	No	0.0058 J	0.0031	mg/kg	ENSB08-010-110910	1 / 54	89.6	EPA Region V Mammals	0	6.5E-05	Eliminated HQ < 1
SW8260	2-Hexanone	591-78-6	No	ND	0.0024	mg/kg	ND	0 / 54	12.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0018	mg/kg	ND	0 / 54	443	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	No	ND	0.035	mg/kg	ND	0 / 54	2.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	No	0.03	0.00089	mg/kg	ENSB08-010-110910	1 / 56	0.255	EPA Region V Mammals	0	0.12	Eliminated HQ < 1
SW8260	Bromodichloromethane	75-27-4	No	ND	0.00089	mg/kg	ND	0 / 54	0.54	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.001	mg/kg	ND	0 / 54	15.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0018	mg/kg	ND	0 / 54	0.235	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	0.0022 J	0.0023	mg/kg	NPSS08FD-000-101310	1 / 54	0.0941	EPA Region V Mammals	0	0.023	Eliminated HQ < 1
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.0017	mg/kg	ND	0 / 54	2.98	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.00089	mg/kg	ND	0 / 54	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0018	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.0026	mg/kg	ND	0 / 54	1.19	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0018	mg/kg	ND	0 / 54	10.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.0021	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.00089	mg/kg	ND	0 / 54	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	0.022	0.0017	mg/kg	ENSB08-010-110910	1 / 54	0.255	Surrogate - Benzene	0	0.086	Eliminated HQ < 1
SW8260	Dibromochloromethane	124-48-1	No	ND	0.00089	mg/kg	ND	0 / 54	2.05	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.0026	mg/kg	ND	0 / 54	39.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	0.17	0.0013	mg/kg	ENSB08-010-110910	2 / 56	5.16	EPA Region V Mammals	0	0.033	Eliminated HQ < 1
SW8260	Isopropylbenzene	98-82-8	No	0.013	0.0014	mg/kg	ENSB08-010-110910	1 / 54	0.255	Surrogate - Benzene	0	0.051	Eliminated HQ < 1
SW8260	Methyl acetate	79-20-9	No	ND	0.0014	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.0027	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	No	0.047	0.0021	mg/kg	ENSB08-010-110910	2 / 54	0.255	Surrogate - Benzene	0	0.18	Eliminated HQ < 1
SW8260	Methylene chloride	75-09-2	No	0.0055 J	0.0036	mg/kg	NPSB10-010-011212	6 / 54	4.05	EPA Region V Mammals	0	0.0014	Eliminated HQ < 1
SW8260	Naphthalene	91-20-3	No	0.006 J	0.0011	mg/kg	ESSB09-010-011012	2 / 54	0.0994	EPA Region V Mammals	0	0.060	Eliminated HQ < 1
SW8260	n-Butylbenzene	104-51-8	No	ND	0.00089	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	No	0.039	0.0013	mg/kg	ENSB08-010-110910	2 / 54	0.255	Surrogate - Benzene	0	0.15	Eliminated HQ < 1
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.00089	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	ND	0.00089	mg/kg	ND	0 / 54	300	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.00089	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.0014	mg/kg	ND	0 / 54	9.92	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	0.0014 J	0.0036	mg/kg	ENSB07-010-120810	2 / 54	200	ORNL Plants	0	7.0E-06	Eliminated HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.0013	mg/kg	ND	0 / 54	0.784	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.00089	mg/kg	ND	0 / 54	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.0023	mg/kg	ND	0 / 54	12.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.0011	mg/kg	ND	0 / 54	16.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.0014	mg/kg	ND	0 / 54	0.646	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	0.15	0.0037	mg/kg	ENSB08-010-110910	3 / 54	10	EPA Region V Plants	0	0.015	Eliminated HQ < 1
SW8270	1,1'-Biphenyl	92-52-4	No	0.004 J	0.16	mg/kg	ENSS04-000-101110	1 / 54	60	ORNL Plants	0	6.7E-05	Eliminated HQ < 1
SW8270	1-Methylnaphthalene	90-12-0	No	0.013	0.13	mg/kg	ENSB07-010-120810	11 / 54	3.24	Surrogate - 2-Methylnaphthalene	0	0.0040	Eliminated HQ < 1
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.16	mg/kg	ND	0 / 54	4.0	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.18	mg/kg	ND	0 / 54	10	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.12	mg/kg	ND	0 / 54	87.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	0.0042 J	0.18	mg/kg	ENSB08-010-110910	1 / 54	0.010	EPA Region V Plants	0	0.42	Eliminated HQ < 1
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.18	mg/kg	ND	0 / 54	20	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.18	mg/kg	ND	0 / 54	6.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.18	mg/kg	ND	0 / 54	5.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.23	mg/kg	ND	0 / 54	0.0122	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.18	mg/kg	ND	0 / 54	0.243	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L	91-57-6	No	0.019	0.15	mg/kg	ENSB07-010-120810	17 / 54	3.24	EPA Region V Mammals	0	0.0059	Evaluated as LMW PAH
SW8270	2-Methylphenol	95-48-7	No	0.005 JL	0.16	mg/kg	ENSB07-010-120810	1 / 54	40.4	EPA Region V Mammals	0	0.00012	Eliminated HQ < 1
SW8270	2-Nitroaniline	88-74-4	No	ND	0.18	mg/kg	ND	0 / 54	74.1</				

Table 2
Summary of Detected and Non-Detected Constituents for the North Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.18	mg/kg	ND	0 / 54	7.95	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Chloroaniline	106-47-8	No	ND	0.12	mg/kg	ND	0 / 54	1.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.12	mg/kg	ND	0 / 54	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Nitroaniline	100-01-6	No	ND	0.18	mg/kg	ND	0 / 54	21.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Nitrophenol	100-02-7	No	ND	0.21	mg/kg	ND	0 / 54	7.0	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Acenaphthene - L	83-32-9	No	0.045	0.12	mg/kg	WSB07-010-110210	16 / 54	20	ORNL Plants	0	0.0023	Evaluated as LMW PAH
SW8270	Acenaphthylene - L	208-96-8	No	0.062 J	0.12	mg/kg	NPSS01-000-101210	10 / 54	682	EPA Region V Mammals	0	9.1E-05	Evaluated as LMW PAH
SW8270	Acetophenone	98-86-2	No	0.023 JL	0.13	mg/kg	NPSS02-000-101310	10 / 54	300	EPA Region V Mammals	0	7.7E-05	Eliminated HQ < 1
SW8270	Anthracene-L	120-12-7	No	0.089 JL	0.12	mg/kg	NPSS05-000-101310	35 / 54	1480	EPA Region V Mammals	0	6.0E-05	Evaluated as LMW PAH
SW8270	Benz(a)anthracene-H	56-55-3	No	0.34	0.16	mg/kg	ENSB08-010-110910	44 / 54	5.21	EPA Region V Mammals	0	0.065	Evaluated as HMW PAH
SW8270	Benzaldehyde	100-52-7	No	0.011 JL	0.26	mg/kg	NPSS02-000-101310	2 / 54	0.255	Surrogate - Benzene	0	0.043	Eliminated HQ < 1
SW8270	Benzo(a)pyrene-H	50-32-8	No	0.5	0.13	mg/kg	ENSB08-010-110910	45 / 54	1.52	EPA Region V Mammals	0	0.33	Evaluated as HMW PAH
SW8270	Benzo(b)fluoranthene	205-99-2	No	0.67	0.18	mg/kg	ENSB08-010-110910	46 / 54	59.8	EPA Region V Mammals	0	0.011	Eliminated HQ < 1
SW8270	Benzo(g,h,i)perylene	191-24-2	No	0.36	0.16	mg/kg	ENSB08-010-110910	39 / 54	119	EPA Region V Mammals	0	0.0030	Eliminated HQ < 1
SW8270	Benzo(k)fluoranthene	207-08-9	No	0.38 JL	0.18	mg/kg	NPSS02-000-101310	45 / 54	148	EPA Region V Mammals	0	0.0026	Eliminated HQ < 1
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.13	mg/kg	ND	0 / 54	0.302	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.16	mg/kg	ND	0 / 54	23.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.15	mg/kg	ND	0 / 54	19.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	84	3.5	mg/kg	NPSS01-000-101210	15 / 54	0.925	EPA Region V Mammals	1	91	Retained HQ > 1
SW8270	Butyl benzyl phthalate	85-68-7	No	0.076 J	0.14	mg/kg	NPSS07-000-101310	15 / 54	0.239	EPA Region V Mammals	0	0.32	Eliminated HQ < 1
SW8270	Caprolactam	105-60-2	No	0.22	0.13	mg/kg	ENSS06-000-101110	6 / 54	0.255	Surrogate - Benzene	0	0.86	Eliminated HQ < 1
SW8270	Carbazole	86-74-8	No	0.065 J	0.12	mg/kg	NPSS01-000-101210	28 / 54	0.0994	Surrogate - Naphthalene	0	0.65	Eliminated HQ < 1
SW8270	Chrysene-H	218-01-9	No	0.55	0.16	mg/kg	NPSS05-000-101310	49 / 54	4.73	EPA Region V Mammals	0	0.12	Evaluated as HMW PAH
SW8270	Dibenz(a,h)anthracene-H	53-70-3	No	0.14	0.12	mg/kg	ENSB08-010-110910	18 / 54	18.4	EPA Region V Mammals	0	0.0076	Evaluated as HMW PAH
SW8270	Dibenzofuran	132-64-9	No	0.017	0.12	mg/kg	WSB07-010-110210	9 / 54	0.0994	Surrogate - Naphthalene	0	0.2	Eliminated HQ < 1
SW8270	Diethyl phthalate	84-66-2	No	ND	0.18	mg/kg	ND	0 / 54	100	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	No	0.0085	0.13	mg/kg	ENSS03FD-000-101110	2 / 54	200	ORNL Earthworms	0	4.25E-05	Eliminated HQ < 1
SW8270	Di-n-butyl phthalate	84-74-2	No	0.041 J	0.14	mg/kg	ENSS06-000-101110	11 / 54	200	ORNL Plants	0	0.00021	Eliminated HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	No	0.062 J	0.16	mg/kg	ENSS03FD-000-101110	6 / 54	709	EPA Region V Mammals	0	8.7E-05	Eliminated HQ < 1
SW8270	Fluoranthene-H	206-44-0	No	0.81	0.12	mg/kg	ENSB08-010-110910	50 / 54	122	EPA Region V Mammals	0	0.0066	Evaluated as HMW PAH
SW8270	Fluorene-L	86-73-7	No	0.023	0.12	mg/kg	WSB07-010-110210	16 / 54	30	ORNL Earthworms	0	0.00077	Evaluated as LMW PAH
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.14	mg/kg	ND	0 / 54	0.199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.24	mg/kg	ND	0 / 54	0.0398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.2	mg/kg	ND	0 / 54	10	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	No	ND	0.22	mg/kg	ND	0 / 54	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	High Molecular Weight PAHs	HPAH	No	2.95	0.0178	mg/kg	ENSB08-010-110910	51 / 54	1.1	Eco SSL Mammals	8	2.7	Retained HQ > 1
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	No	0.44	0.19	mg/kg	ENSB08-010-110910	35 / 54	109	EPA Region V Mammals	0	0.0040	Eliminated HQ < 1
SW8270	Isophorone	78-59-1	No	ND	0.17	mg/kg	ND	0 / 54	139	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Low Molecular Weight PAHs	LPAH	No	0.98	0.0217	mg/kg	NPSS08-000-101310	51 / 54	29	Eco SSL Earthworms	0	0.034	Eliminated HQ < 1
SW8270	Naphthalene-L	91-20-3	No	0.019 JL	0.18	mg/kg	NPSS02-000-101310	10 / 54	0.0994	EPA Region V Mammals	0	0.19	Evaluated as LMW PAH
SW8270	Nitrobenzene	98-95-3	No	ND	0.18	mg/kg	ND	0 / 54	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.22	mg/kg	ND	0 / 54	0.544	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	No	0.0067 J	0.12	mg/kg	ENSB09-010-110910	1 / 54	20	ORNL Earthworms	0	3.35E-04	Eliminated HQ < 1
SW8270	Pentachlorophenol	87-86-5	Yes	0.012	0.16	mg/kg	ENSB04-010-120910	1 / 54	5.0	Eco SSL Plants	0	2.40E-03	Retained detected bioaccumulative
SW8270	Phenanthrene-L	85-01-8	No	0.31 JL	0.17	mg/kg	NPSS05-000-101310	44 / 54	45.7	EPA Region V Mammals	0	0.0068	Evaluated as LMW PAH
SW8270	Phenol	108-95-2	No	0.037 JL	0.18	mg/kg	ENSB07-010-120810	3 / 54	30	ORNL Earthworms	0	0.0012	Eliminated HQ < 1
SW8270	Pyrene-H	129-00-0	No	0.71	0.12	mg/kg	ENSB08-010-110910	50 / 54	78.5	EPA Region V Mammals	0	0.0090	Evaluated as HMW PAH
SW9014	Cyanide	57-12-5	No	34.3	1.3	mg/kg	ENSS08-000-101110	10 / 54	1.33	EPA Region V Mammals	8	26	Retained HQ > 1

This table lists all soil data (0-0.5 ft and 1-2 ft soil depths) combined for the North Pit Terrestrial exposure area and data are screened against soil benchmarks using maximum detected concentration.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

HMW PAHs, LMW PAHs and Total PCBs screened as a class and not individual constituents.

Table 18 summarizes the COPCs in soil from the North Pit exposure area for further evaluation.

L - denotes Low Molecular Weight PAH

PCB - Polychlorinated Biphenyl

ORNL - Oak Ridge National Laboratory

ND - Not Detected

Table 3
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (South)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	T	No	6.95	0.37	mg/l	EDSW03-111810	5 / 5	0.087	TCEQ Benchmark (2017)	5	80	Retained HQ > 1
SW6020	Antimony	7440-36-0	T	No	0.00106 J	0.0005	mg/l	EDSW-011717	5 / 5	2.20	TCEQ Benchmark (2017)	0	4.8E-04	Eliminated; HQ < 1
SW6020	Arsenic	7440-38-2	T	No	0.0091	0.0009	mg/l	EDSW02-111810	5 / 5	0.15	TCEQ Benchmark (2017)	0	0.061	Eliminated; HQ < 1
SW6020	Barium	7440-39-3	T	No	0.301	0.0007	mg/l	EDSW-011717	5 / 5	16	TCEQ Benchmark (2017)	0	0.019	Eliminated; HQ < 1
SW6020	Beryllium	7440-41-7	T	No	0.000507 J	0.0003	mg/l	EDSW01-FD-111810	1 / 5	0.0053	TCEQ Benchmark (2017)	0	0.10	Eliminated; HQ < 1
SW6020	Cadmium	7440-43-9	D	No	ND	0.0006	mg/l	ND	0 / 5	0.000341	Texas RBEL hardness specific	ND	ND	Eliminated; not detected
SW6020	Chromium	7440-47-3	D	No	0.00116 J	0.0006	mg/l	EDSW02-111810	4 / 5	0.109	Texas RBEL hardness specific	0	0.011	Eliminated; HQ < 1
SW6020	Cobalt	7440-48-4	T	No	0.00244 J	0.0005	mg/l	EDSW03-111810	5 / 5	1.5	TCEQ Benchmark (2017)	0	0.0016	Eliminated; HQ < 1
SW6020	Copper	7440-50-8	D	No	0.00479 J	0.0005	mg/l	EDSW02-111810	5 / 5	0.0141	Texas RBEL hardness specific	0	0.34	Eliminated; HQ < 1
SW6020	Lead	7439-92-1	D	No	0.00133 J	0.0006	mg/l	EDSW02-111810	4 / 5	0.00418	Texas RBEL hardness specific	0	0.32	Eliminated; HQ < 1
SW6020	Manganese	7439-96-5	T	No	0.391	0.0008	mg/l	EDSW-011717	5 / 5	1.93	Texas RBEL hardness specific	0	0.20	Eliminated; HQ < 1
SW6020	Nickel	7440-02-0	D	No	0.00293 J	0.0014	mg/l	EDSW03-111810	5 / 5	0.0774	Texas RBEL hardness specific	0	0.038	Eliminated; HQ < 1
SW6020	Selenium	7782-49-2	T	Yes	ND	0.0025	mg/l	ND	0 / 5	0.005	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Silver	7440-22-4	D	No	ND	0.0007	mg/l	ND	0 / 5	0.0001	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Thallium	7440-28-0	T	Yes	ND	0.0008	mg/l	ND	0 / 5	0.18	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Vanadium	7440-62-2	T	No	0.0103	0.0007	mg/l	EDSW03-111810	5 / 5	0.02	TCEQ Benchmark (2017)	0	0.52	Eliminated; HQ < 1
SW6020	Zinc	7440-66-6	D	No	0.0108	0.0025	mg/l	EDSW-011717	5 / 5	0.176	Texas RBEL hardness specific	0	0.061	Eliminated; HQ < 1
SW7470	Mercury	7439-97-6	T	Yes	ND	0.000042	mg/l	ND	0 / 5	0.0013	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	4,4'-DDD	72-54-8	N	Yes	0.0000042	0.0000025	mg/l	EDSW02-111810	2 / 4	1.10E-05	TCEQ Benchmark (2017)	0	0.38	Retained detected bioaccumulative
SW8081	4,4'-DDE	72-55-9	N	Yes	0.0000066	0.0000025	mg/l	EDSW01-111810	3 / 4	1.10E-04	TCEQ Benchmark (2017)	0	0.060	Retained detected bioaccumulative
SW8081	4,4'-DDT	50-29-3	N	Yes	0.000011 J	0.0000025	mg/l	EDSW02-111810	1 / 4	1.00E-06	TCEQ Benchmark (2017)	1	11	Retained detected bioaccumulative; HQ>1
SW8081	Aldrin	309-00-2	N	No	0.0000055 J	0.0000012	mg/l	EDSW01-111810	4 / 4	0.0003	TCEQ Benchmark (2017)	0	0.018	Eliminated; HQ < 1
SW8081	alpha-BHC	319-84-6	N	No	ND	0.0000012	mg/l	ND	0 / 4	0.074	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	alpha-Chlordane	5103-71-9	N	No	ND	0.0000025	mg/l	ND	0 / 4	4.0E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	beta-BHC	319-85-7	N	No	ND	0.0000012	mg/l	ND	0 / 4	0.083	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	delta-BHC	319-86-8	N	No	ND	0.0000012	mg/l	ND	0 / 4	0.141	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Dieldrin	60-57-1	N	No	ND	0.0000025	mg/l	ND	0 / 4	2.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	N	No	0.0000047 J	0.0000012	mg/l	EDSW02-111810	4 / 4	5.60E-05	TCEQ Benchmark (2017)	0	0.084	Eliminated; HQ < 1
SW8081	Endosulfan II	33213-65-9	N	No	ND	0.0000025	mg/l	ND	0 / 4	5.60E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	N	No	ND	0.0000025	mg/l	ND	0 / 4	5.60E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endrin	72-20-8	N	No	ND	0.0000025	mg/l	ND	0 / 4	2.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endrin aldehyde	7421-93-4	N	No	ND	0.0000025	mg/l	ND	0 / 4	NA	NA	ND	ND	Eliminated; not detected
SW8081	gamma-BHC	58-89-9	N	No	ND	0.0000012	mg/l	ND	0 / 4	8.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	gamma-Chlordane	5103-74-2	N	No	0.0000083	0.0000025	mg/l	EDSW01-FD-111810	3 / 4	4.00E-06	TCEQ Benchmark (2017)	3	2.1	Retained; HQ > 1
SW8081	Heptachlor	76-44-8	N	No	0.0000041 J	0.0000012	mg/l	EDSW03-111810	4 / 4	4.00E-06	TCEQ Benchmark (2017)	1	1.0	Eliminated; HQ = 1
SW8081	Heptachlor epoxide	1024-57-3	N	No	ND	0.0000012	mg/l	ND	0 / 4	3.80E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	N	No	ND	0.000012	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	N	No	ND	0.000025	mg/l	ND	0 / 4	2.00E-07	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Total PCBs	TPCB	N	Yes	ND	0.0002	mg/l	ND	0 / 4	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	N	No	ND	0.0003	mg/l	ND	0 / 5	NA	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	N	No	ND	0.0002	mg/l	ND	0 / 5	4.91	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	N	No	ND	0.0005	mg/l	ND	0 / 5	0.465	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	N	No	ND	0.001	mg/l	ND	0 / 5	0.207	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5</td												

Table 3
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (South)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	2-Hexanone	591-78-6	N	No	ND	0.001	mg/l	ND	0 / 5	6.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	N	No	ND	0.0007	mg/l	ND	0 / 5	26.40	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	N	No	0.0028	0.002	mg/l	EDSW02-111810	3 / 5	101.2	TCEQ Benchmark (2017)	0	2.8E-05	Eliminated; HQ < 1
SW8260	Benzene	71-43-2	N	No	ND	0.0002	mg/l	ND	0 / 5	0.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromodichloromethane	75-27-4	N	No	ND	0.0002	mg/l	ND	0 / 5	2.16	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	N	No	ND	0.0004	mg/l	ND	0 / 5	0.149	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	N	No	ND	0.0004	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	N	No	ND	0.0006	mg/l	ND	0 / 5	0.105	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	N	No	ND	0.0005	mg/l	ND	0 / 5	0.098	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	N	No	ND	0.0003	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	N	No	ND	0.0003	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	N	No	ND	0.0002	mg/l	ND	0 / 5	1.79	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	N	No	ND	0.0002	mg/l	ND	0 / 5	28	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	N	No	ND	0.0002	mg/l	ND	0 / 5	14	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.205	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	N	No	ND	0.0003	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dibromochloromethane	124-48-1	N	No	ND	0.0003	mg/l	ND	0 / 5	0.129	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	N	No	ND	0.0003	mg/l	ND	0 / 5	1.963	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	N	No	ND	0.0003	mg/l	ND	0 / 5	1.00	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Isopropylbenzene	98-82-8	N	No	ND	0.0003	mg/l	ND	0 / 5	0.255	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Methyl acetate	79-20-9	N	No	ND	0.001	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	N	No	ND	0.0002	mg/l	ND	0 / 5	51	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	N	No	ND	0.0003	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylene chloride	75-09-2	N	No	ND	0.001	mg/l	ND	0 / 5	22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	N	No	ND	0.0003	mg/l	ND	0 / 5	0.25	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	n-Butylbenzene	104-51-8	N	No	ND	0.0004	mg/l	ND	0 / 5	0.036	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	N	No	ND	0.0003	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	sec-Butylbenzene	135-98-8	N	No	ND	0.0003	mg/l	ND	0 / 5	0.041	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	N	No	ND	0.0003	mg/l	ND	0 / 5	1.25	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	N	No	ND	0.0003	mg/l	ND	0 / 5	0.048	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	N	No	ND	0.0003	mg/l	ND	0 / 5	1.28	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	N	No	0.00025 J	0.0002	mg/l	EDSW02-111810/ EDSW01-111810	3 / 5	3.40	TCEQ Benchmark (2017)	0	7.4E-05	Eliminated; HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	N	No	ND	0.0002	mg/l	ND	0 / 5	22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	N	No	ND	0.0002	mg/l	ND	0 / 5	0.205	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	N	No	ND	0.0002	mg/l	ND	0 / 5	3.00	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	N	No	ND	0.0003	mg/l	ND	0 / 5	0.871	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	N	No	ND	0.0002	mg/l	ND	0 / 5	2.82	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	N	No	ND	0.0003	mg/l	ND	0 / 5	1.34	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	1,1'-Biphenyl	92-52-4	N	No	ND	0.0001	mg/l	ND	0 / 5	0.014	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	1-Methylnaphthalene	90-12-0	N	No	ND	0.00009	mg/l	ND	0 / 5	0.0021	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4,5-Trichlorophenol	95-95-4	N	No	ND	0.00009	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0135	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	N	No	ND	0.00008	mg/l	ND	0 / 5	0.085	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	N	No	0.00021	0.00008	mg/l	EDSW-011717	1 / 5	0.105	TCEQ Benchmark (2017)	0	0.0020	Eliminated; HQ < 1
SW8270	2,4-Dinitrophenol	51-28-5	N	No	ND	0.00008	mg/l	ND	0 / 5	0.031	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	N	No	ND	0.00009	mg/l	ND	0 / 5	1.22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	N	No	ND	0.00007	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.054	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	N	No	ND	0.00008	mg/l	ND	0 / 5	0.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene	91-57-6	N	No	ND	0.00007	mg/l	ND	0 / 5	0.063	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Methylphenol	95-48-7	N	No	ND	0.00008	mg/l	ND	0 / 5	0.56	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Nitrophenol	88-75-5	N	No	ND	0.00007	mg/l	ND	0 / 5	0.959	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	3&4-Methylphenol	106-44-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.272	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	3,3'-Dichlorobenzidine	91-94-1	N											

Table 3
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (South)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated	
SW8270	4-Nitrophenol	100-02-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.532	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Acenaphthene	83-32-9	N	No	ND	0.00009	mg/l	ND	0 / 5	0.023	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Acenaphthylene	208-96-8	N	No	ND	0.00007	mg/l	ND	0 / 5	4.84	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected	
SW8270	Acetophenone	98-86-2	N	No	0.00040	0.0001	mg/l	EDSW-011717	2 / 5	1.65	Surrogate - Dimethyl phthalate	0	2.4E-04	Eliminated; HQ < 1	
SW8270	Anthracene	120-12-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0003	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Benz(a)anthracene	56-55-3	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0346	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Benzaldehyde	100-52-7	N	No	ND	0.00012	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Benzo(a)pyrene	50-32-8	N	No	ND	0.00008	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Benzo(b)fluoranthene	205-99-2	N	No	ND	0.00009	mg/l	ND	0 / 5	0.00907	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected	
SW8270	Benzo(g,h,i)perylene	191-24-2	N	No	ND	0.00009	mg/l	ND	0 / 5	0.00764	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected	
SW8270	Benzo(k)fluoranthene	207-08-9	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	0.00009	mg/l	ND	0 / 5	11	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroethyl)ether	111-44-4	N	No	ND	0.00007	mg/l	ND	0 / 5	12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	0.00007	mg/l	ND	0 / 5	6.308	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	N	No	0.0026	JL	0.0002	mg/l	EDSW01-111810	3 / 5	0.02	TCEQ Benchmark (2017)	0	0.13	Eliminated; HQ < 1
SW8270	Butyl benzyl phthalate	85-68-7	N	No	ND	0.0001	mg/l	ND	0 / 4	0.093	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Caprolactam	105-60-2	N	No	ND	0.00008	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Carbazole	86-74-8	N	No	ND	0.00007	mg/l	ND	0 / 5	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Chrysene	218-01-9	N	No	ND	0.00007	mg/l	ND	0 / 5	0.007	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Dibenz(a,h)anthracene	53-70-3	N	No	ND	0.00008	mg/l	ND	0 / 5	0.005	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Dibenzo furan	132-64-9	N	No	ND	0.00008	mg/l	ND	0 / 5	0.094	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Diethyl phthalate	84-66-2	N	No	ND	0.00007	mg/l	ND	0 / 5	1.043	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Dimethyl phthalate	131-11-3	N	No	ND	0.0001	mg/l	ND	0 / 5	1.65	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Di-n-butyl phthalate	84-74-2	N	No	0.000046	J	0.00007	mg/l	ND	1 / 5	0.007	TCEQ Benchmark (2017)	0	0.0066	Eliminated; HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	N	No	ND	0.00009	mg/l	ND	0 / 5	0.022	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Fluoranthene	206-44-0	N	No	ND	0.00007	mg/l	ND	0 / 5	0.00616	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Fluorene	86-73-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.011	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Hexachlorobenzene	118-74-1	N	Yes	ND	0.0001	mg/l	ND	0 / 5	0.00368	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected	
SW8270	Hexachlorobutadiene	87-68-3	N	No	ND	0.00015	mg/l	ND	0 / 5	0.00436	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Hexachlorocyclopentadiene	77-47-4	N	No	ND	0.00008	mg/l	ND	0 / 5	0.00001	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Hexachloroethane	67-72-1	N	No	ND	0.00017	mg/l	ND	0 / 5	0.012	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.00431	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected	
SW8270	Isophorone	78-59-1	N	No	ND	0.00007	mg/l	ND	0 / 5	6	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Naphthalene	91-20-3	N	No	ND	0.0001	mg/l	ND	0 / 5	0.25	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Nitrobenzene	98-95-3	N	No	ND	0.00009	mg/l	ND	0 / 5	1.1	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.02	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodiphenylamine	86-30-6	N	No	ND	0.00009	mg/l	ND	0 / 5	0.29	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Pentachlorophenol	87-86-5	N	No	ND	0.00008	mg/l	ND	0 / 5	0.00245	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Phenanthrene	85-01-8	N	No	ND	0.00007	mg/l	ND	0 / 5	0.03	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Phenol	108-95-2	N	No	ND	0.00007	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Pyrene	129-00-0	N	No	0.000064	J	0.00007	mg/l	EDSW-011717	1 / 5	0.007	TCEQ Benchmark (2017)	0	0.0091	Eliminated; HQ < 1
SW8270	Total PAHs	TPAH	N	No	0.000064	J	0.000725	mg/l	EDSW-011717	1 / 5	NA	NA	NA	Retained; no benchmark value	
SW9014	Cyanide	57-12-5	T	No	0.005	J	0.004	mg/l	EDSW01-111810	1 / 4	0.0107	TCEQ Benchmark (2017)	0	0.47	Eliminated; HQ < 1

J - Estimated Value

JL - Estimated Value, Biased Low

T - Total Metals

D - Dissolved Metals

N - Total/Dissolved not applicable

ND - Not Detected

NA - Not Applicable

WQ - Water Quality

RBEL - Risk Based Exposure Limit

Table 4
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (North)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	T	No	2.11	0.18	mg/l	EDSW04-111710	9 / 9	0.75	Geometric Mean; EPA Draft Criteria	6	2.8	Retained; HQ > 1
SW6020	Antimony	7440-36-0	T	No	0.00083 J	0.0025	mg/l	EDSW05-111710	3 / 9	0.73	TCEQ Benchmark (2017)	0	0.0011	Eliminated; HQ < 1
SW6020	Arsenic	7440-38-2	T	No	0.0156 J	0.0045	mg/l	EDSW09-111610	9 / 9	0.078	TCEQ Benchmark (2017)	0	0.20	Eliminated; HQ < 1
SW6020	Barium	7440-39-3	T	No	0.639	0.0035	mg/l	EDSW04-111710	9 / 9	25	TCEQ Benchmark (2017)	0	0.026	Eliminated; HQ < 1
SW6020	Beryllium	7440-41-7	T	No	0.000317 J	0.0015	mg/l	EDSW10-111610	1 / 9	0.10	NOAA SQuiRT British Columbia Chronic Value	0	0.0032	Eliminated; HQ < 1
SW6020	Cadmium	7440-43-9	D	No	ND	0.003	mg/l	ND	0 / 9	0.00875	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Chromium	7440-47-3	D	No	0.000641 J	0.003	mg/l	EDSW09-111610	1 / 9	0.0274	NOAA SQuiRT Australian & New Zealand Chronic	0	0.023	Eliminated; HQ < 1
SW6020	Cobalt	7440-48-4	T	No	0.00662	0.0025	mg/l	EDSW11-013112	6 / 9	0.001	NOAA SQuiRT Australian & New Zealand Chronic	6	6.6	Retained; HQ > 1
SW6020	Copper	7440-50-8	D	No	0.00344 J	0.0025	mg/l	EDSW10-013112	5 / 9	0.0036	TCEQ Benchmark (2017)	0	0.96	Eliminated; HQ < 1
SW6020	Lead	7439-92-1	D	No	0.00238 J	0.002	mg/l	EDSW04-111710	2 / 9	0.0053	TCEQ Benchmark (2017)	0	0.45	Eliminated; HQ < 1
SW6020	Manganese	7439-96-5	T	No	2.7	0.005	mg/l	EDSW11-013112	9 / 9	0.10	NOAA SQuiRT British Columbia Chronic Value	9	27	Retained; HQ > 1
SW6020	Nickel	7440-02-0	D	No	0.0122	0.007	mg/l	EDSW11-013112	7 / 9	0.0131	TCEQ Benchmark (2017)	0	0.93	Eliminated; HQ < 1
SW6020	Selenium	7782-49-2	T	Yes	0.00476 J	0.012	mg/l	EDSW06-111710	6 / 9	0.136	TCEQ Benchmark (2017)	0	0.035	Retained; detected bioaccumulative
SW6020	Silver	7440-22-4	D	No	ND	0.0035	mg/l	ND	0 / 9	0.00019	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Thallium	7440-28-0	T	Yes	ND	0.004	mg/l	ND	0 / 9	2.1	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Vanadium	7440-62-2	T	No	0.00735	0.0035	mg/l	EDSW04-111710	7 / 9	0.050	NOAA SQuiRT British Columbia Chronic Value	0	0.15	Eliminated; HQ < 1
SW6020	Zinc	7440-66-6	D	No	0.0542	0.012	mg/l	EDSW05-111710	8 / 9	0.0842	TCEQ Benchmark (2017)	0	0.64	Eliminated; HQ < 1
SW7470	Mercury	7439-97-6	T	Yes	0.000074 J	0.000042	mg/l	EDSW06-111710	6 / 9	0.0011	TCEQ Benchmark (2017)	0	0.067	Retained; detected bioaccumulative
SW8081	4,4'-DDD	72-54-8	N	Yes	0.0000056 JL	0.000025	mg/l	EDSW06-111710	1 / 9	0.000025	TCEQ Benchmark (2017)	0	0.22	Retained; detected bioaccumulative
SW8081	4,4'-DDE	72-55-9	N	Yes	0.00001 JL	0.000025	mg/l	EDSW06-111710	2 / 9	0.0014	NOAA SQuiRT Chronic Value	0	0.0071	Retained; detected bioaccumulative
SW8081	4,4'-DDT	50-29-3	N	Yes	0.000048 J	0.000025	mg/l	EDSW05-111710	4 / 9	1.00E-06	TCEQ Benchmark (2017)	4	48	Retained; detected bioaccumulative; HQ>1
SW8081	Aldrin	309-00-2	N	No	0.000029	0.000012	mg/l	EDSW05-111710	1 / 9	0.00013	TCEQ Benchmark (2017)	0	0.22	Eliminated; HQ < 1
SW8081	alpha-BHC	319-84-6	N	No	0.0000038	0.000012	mg/l	EDSW08-111610	1 / 9	0.025	TCEQ Benchmark (2017)	0	1.5E-04	Eliminated; HQ < 1
SW8081	alpha-Chlordane	5103-71-9	N	No	7.50E-06 JL	0.000025	mg/l	EDSW06-111710	1 / 9	4.00E-06	TCEQ Benchmark (2017)	1	1.9	Retained; HQ > 1
SW8081	beta-BHC	319-85-7	N	No	6.10E-05 J	0.000012	mg/l	EDSW05-111710	6 / 9	1.60E-05	TCEQ Benchmark (2017) gamma-BHC as surrogate	3	3.8	Retained; HQ > 1
SW8081	delta-BHC	319-86-8	N	No	1.60E-05 J	0.000012	mg/l	EDSW05-111710	4 / 9	1.60E-05	TCEQ Benchmark (2017) gamma-BHC as surrogate	0	1.0	Eliminated; HQ = 1
SW8081	Dieldrin	60-57-1	N	No	ND	0.000025	mg/l	ND	0 / 9	2.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	N	No	ND	0.000012	mg/l	ND	0 / 9	9.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	N	No	ND	0.000025	mg/l	ND	0 / 9	9.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	N	No	0.0000061 JL	0.000025	mg/l	EDSW06-111710	1 / 9	9.00E-06	TCEQ Benchmark (2017)	0	0.68	Eliminated; HQ < 1
SW8081	Endrin	72-20-8	N	No	ND	0.000025	mg/l	ND	0 / 9	2.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endrin aldehyde	7421-93-4	N	No	0.000014 JL	0.000025	mg/l	EDSW06-111710	1 / 9	2.00E-06	TCEQ Benchmark (2017) Endrin as surrogate	1	7.0	Retained; HQ > 1
SW8081	gamma-BHC	58-89-9	N	No	0.0000062 J	0.000012	mg/l	EDSW07-111610	4 / 9	1.60E-05	TCEQ Benchmark (2017)	0	0.39	Eliminated; HQ < 1
SW8081	gamma-Chlordane	5103-74-2	N	No	0.0000039 JL	0.000025	mg/l	EDSW06-111710	1 / 9	4.00E-06	TCEQ Benchmark (2017)	0	0.98	Eliminated; HQ < 1
SW8081	Heptachlor	76-44-8	N	No	0.000014 J	0.000012	mg/l	EDSW04-111710	5 / 9	4.00E-06	TCEQ Benchmark (2017)	2	3.5	Retained; HQ > 1
SW8081	Heptachlor epoxide	1024-57-3	N	No	0.000016 J	0.000012	mg/l	EDSW05-111710	4 / 9	3.60E-06	TCEQ Benchmark (2017)	2	4.4	Retained; HQ > 1
SW8081	methoxychlor	72-43-5	N	No	0.000056 J	0.00012	mg/l	EDSW10-111610	1 / 9	3.00E-05	TCEQ Benchmark (2017)	1	1.9	Retained; HQ > 1
SW8081	Toxaphene	8001-35-2	N	No	ND	0.00025	mg/l	ND	0 / 8	2.00E-07	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Total PCBs	TPCB	N	Yes	ND	0.0002	mg/l	ND	0 / 9	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	N	No	ND	0.0002	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	N	No	ND	0.0001	mg/l	ND	0 / 7	7.				

Table 4
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (North)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	Benzene	71-43-2	N	No	ND	0.0001	mg/l	ND	0 / 7	1.09	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromodichloromethane	75-27-4	N	No	ND	0.0002	mg/l	ND	0 / 7	6.4	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	N	No	ND	0.0003	mg/l	ND	0 / 7	1.22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	N	No	ND	0.0003	mg/l	ND	0 / 7	0.60	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	N	No	ND	0.0002	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	N	No	ND	0.0002	mg/l	ND	0 / 7	5.00	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	N	No	ND	0.0001	mg/l	ND	0 / 7	1.00	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloorethane	75-00-3	N	No	ND	0.0003	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	N	No	ND	0.0001	mg/l	ND	0 / 7	2.8	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	N	No	ND	0.0002	mg/l	ND	0 / 7	13.5	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	N	No	ND	0.0002	mg/l	ND	0 / 7	1.12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	N	No	ND	0.0001	mg/l	ND	0 / 7	0.04	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dibromochloromethane	124-48-1	N	No	ND	0.0001	mg/l	ND	0 / 7	6.4	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	N	No	ND	0.0002	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	N	No	ND	0.0002	mg/l	ND	0 / 7	0.52	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Isopropylbenzene	98-82-8	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	NA	NA	Eliminated; not detected
SW8260	Methyl acetate	79-20-9	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	N	No	ND	0.0001	mg/l	ND	0 / 7	18	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	N	No	ND	0.0002	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylene chloride	75-09-2	N	No	ND	0.0002	mg/l	ND	0 / 7	10.85	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	N	No	ND	0.0001	mg/l	ND	0 / 7	0.125	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	n-Butylbenzene	104-51-8	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	NA	NA	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	NA	NA	Eliminated; not detected
SW8260	sec-Butylbenzene	135-98-8	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	NA	NA	Eliminated; not detected
SW8260	Styrene	100-42-5	N	No	ND	0.0001	mg/l	ND	0 / 7	0.455	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	N	No	ND	0.0001	mg/l	ND	0 / 7	NA	NA	NA	NA	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	N	No	ND	0.0003	mg/l	ND	0 / 7	0.50	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	N	No	ND	0.0001	mg/l	ND	0 / 7	1.30	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,2-Dichloroethene	156-60-5	N	No	ND	0.0003	mg/l	ND	0 / 7	1.12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	N	No	ND	0.0001	mg/l	ND	0 / 7	0.04	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	N	No	0.00035 J	0.0001	mg/l	EDSW09-111610	1 / 7	1.60	TCEQ Benchmark (2017)	0	2.2E-04	Eliminated; HQ < 1
SW8260	Trichlorofluoromethane	75-69-4	N	No	ND	0.0002	mg/l	ND	0 / 7	6.4	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	N	No	ND	0.0004	mg/l	ND	0 / 7	NA	NA	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	N	No	ND	0.0003	mg/l	ND	0 / 7	0.85	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	1,1'-Biphenyl	92-52-4	N	No	ND	0.0001	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	1-Methylnaphthalene	90-12-0	N	No	ND	0.00009	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	2,4,5-Trichlorophenol	95-95-4	N	No	ND	0.00009	mg/l	ND	0 / 9	0.012	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	N	No	ND	0.00007	mg/l	ND	0 / 9	0.061	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	N	No	ND	0.00008	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	N	No	ND	0.00008	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrophenol	51-28-5	N	No	ND	0.00008	mg/l	ND	0 / 9	0.67	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	N	No	ND	0.00009	mg/l	ND	0 / 9	8.6	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	N	No	ND	0.00007	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	N	No	ND	0.0001	mg/l	ND	0 / 9	0.0075	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	N	No	ND	0.00008	mg/l	ND	0 / 9	0.265	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene	91-57-6	N	No	ND	0.00007	mg/l	ND	0 / 9	0.03	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Methylphenol	95-48-7	N	No	ND	0.00008	mg/l	ND	0 / 9	0.51	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	N	No	ND	0.0001	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Nitrophenol	88-75-5	N	No	ND	0.00007	mg/l	ND	0 / 9	1.47	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	3&4-Methylphenol	106-44-5	N	No	ND	0.0001	mg/l	ND	0 / 9	0.51	TCEQ In House WQ Chronic Value	ND	ND	Eliminated; not detected
SW8270	3,3'-Dichlorobenzidine	91-94-1	N	No	ND	0.00007	mg/l	ND	0 / 9	0.037	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	3-Nitroaniline	99-09-2	N	No	ND	0.00008	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	N	No	ND	0.00008	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Bromophenyl phenyl ether	101-55-3	N	No	ND	0.00009	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Chloro-3-methylphenol	59-50-7	N	No	ND	0.0001	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected

Table 4
Summary of Detected and Non-Detected Constituents for East Ditch Surface Water (North)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	Benzo(a)pyrene	50-32-8	N	No	ND	0.00008	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Benzo(b)fluoranthene	205-99-2	N	No	ND	0.00009	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Benzo(g,h,i)perylene	191-24-2	N	No	ND	0.00009	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Benzo(k)fluoranthene	207-08-9	N	No	ND	0.0001	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	0.00009	mg/l	ND	0 / 9	6.4	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	N	No	ND	0.00007	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	0.00007	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	N	No	0.0011 JL	0.0002	mg/l	EDSW05-111710	5 / 9	0.10	TCEQ Benchmark (2017)	0	0.011	Eliminated HQ < 1
SW8270	Butyl benzyl phthalate	85-68-7	N	No	ND	0.0001	mg/l	ND	0 / 9	0.147	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Caprolactam	105-60-2	N	No	ND	0.00008	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	Carbazole	86-74-8	N	No	ND	0.00007	mg/l	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8270	Chrysene	218-01-9	N	No	ND	0.00007	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Dibenz(a,h)anthracene	53-70-3	N	No	ND	0.00008	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Dibenzofuran	132-64-9	N	No	ND	0.00008	mg/l	ND	0 / 9	0.065	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Diethyl phthalate	84-66-2	N	No	ND	0.00007	mg/l	ND	0 / 9	0.442	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	N	No	ND	0.0001	mg/l	ND	0 / 9	2.90	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Di-n-butyl phthalate	84-74-2	N	No	ND	0.00007	mg/l	ND	0 / 9	0.005	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Di-n-octyl phthalate	117-84-0	N	No	ND	0.00009	mg/l	ND	0 / 9	0.0034	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	Fluoranthene	206-44-0	N	No	0.000056 J	0.00007	mg/l	EDSW10-013112	1 / 9	0.00296	TCEQ Benchmark (2017)	0	0.019	Eliminated; HQ < 1
SW8270	Fluorene	86-73-7	N	No	ND	0.00007	mg/l	ND	0 / 9	0.05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachlorobenzene	118-74-1	N	Yes	ND	0.0001	mg/l	ND	0 / 9	0.129	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	N	No	ND	0.00015	mg/l	ND	0 / 9	0.00032	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	N	No	ND	0.00008	mg/l	ND	0 / 9	0.0037	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	N	No	ND	0.00017	mg/l	ND	0 / 9	0.099	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	N	No	ND	0.0001	mg/l	ND	0 / 9	0.30	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Isophorone	78-59-1	N	No	ND	0.00007	mg/l	ND	0 / 9	0.65	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Naphthalene	91-20-3	N	No	ND	0.0001	mg/l	ND	0 / 7	0.125	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Nitrobenzene	98-95-3	N	No	ND	0.00009	mg/l	ND	0 / 9	1.40	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	0.0001	mg/l	ND	0 / 9	0.12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	N	No	ND	0.00009	mg/l	ND	0 / 9	165	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Pentachlorophenol	87-86-5	N	No	ND	0.00008	mg/l	ND	0 / 9	0.0096	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Phenanthrene	85-01-8	N	No	ND	0.00007	mg/l	ND	0 / 9	0.0046	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Phenol	108-95-2	N	No	ND	0.00007	mg/l	ND	0 / 9	2.75	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Pyrene	129-00-0	N	No	ND	0.00007	mg/l	ND	0 / 9	0.00024	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Total PAHs	TPAH	N	No	0.000497	0.000455	mg/l	EDSW11-013112	2 / 9	0.30	NOAA SQuiRT Acute Value	0	0.0017	Eliminated; HQ < 1
SW9014	Cyanide	57-12-5	T	No	ND	0.004	mg/l	ND	0 / 7	0.0056	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected

J - Estimated Value

ND - Not Detected

NA - Not Applicable

WQ - Water Quality

RBEL - Risk Based Exposure Limit

Table 5
Summary of Detected and Non-detected Constituents for East Ditch Sediment (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	No	14200	34	mg/kg	EDSSD01-000-111810	14 / 14	25500	NOAA SQuIRT	0	0.56	Eliminated HQ < 1
SW6020	Antimony	7440-36-0	No	0.369 J	0.42	mg/kg	EDSSD03C 032217	1 / 14	0.3	TCEQ Benchmark (2017)	1	1.2	Retained HQ > 1
SW6020	Arsenic	7440-38-2	No	3.93	0.1	mg/kg	EDSSD03D 032217	14 / 14	9.79	TCEQ Benchmark (2017)	0	0.40	Eliminated HQ < 1
SW6020	Barium	7440-39-3	No	2690	13	mg/kg	EDSSD03C 032217	14 / 14	NA	NA	NA	NA	Retained, no screening benchmark
SW6020	Beryllium	7440-41-7	No	0.621 J	0.084	mg/kg	EDSSD03C 032217	14 / 14	NA	NA	NA	NA	Retained, no screening benchmark
SW6020	Cadmium	7440-43-9	Yes	3.32	0.067	mg/kg	EDSSD03D 032217	14 / 14	0.99	TCEQ Benchmark (2017)	1	3.4	Retained detected bioaccumulative; HQ>1
SW6020	Chromium	7440-47-3	No	11.9	0.084	mg/kg	EDSSD03C 032217	14 / 14	43.4	TCEQ Benchmark (2017)	0	0.27	Eliminated HQ < 1
SW6020	Cobalt	7440-48-4	No	6.82	0.05	mg/kg	EDSSD02-000-111810	14 / 14	50	TCEQ Benchmark (2017)	0	0.14	Eliminated HQ < 1
SW6020	Copper	7440-50-8	Yes	21.5	0.23	mg/kg	EDSSD03C 032217	14 / 14	31.6	TCEQ Benchmark (2017)	0	0.68	Retained detected bioaccumulative
SW6020	Lead	7439-92-1	No	77	0.084	mg/kg	EDSSD08-000-111810	14 / 14	35.8	TCEQ Benchmark (2017)	3	2.2	Retained HQ > 1
SW6020	Manganese	7439-96-5	No	559	12	mg/kg	EDSSD02-000-111810	14 / 14	460	TCEQ Benchmark (2017)	3	1.2	Retained HQ > 1
SW6020	Nickel	7440-02-0	Yes	8.53	0.1	mg/kg	EDSSD03C 032217	14 / 14	22.7	TCEQ Benchmark (2017)	0	0.38	Retained detected bioaccumulative
SW6020	Selenium	7782-49-2	Yes	0.757 J	0.42	mg/kg	EDSSD01-000-111810	12 / 14	NA	NA	NA	NA	Retained, no screening benchmark
SW6020	Silver	7440-22-4	No	0.213 J	0.067	mg/kg	EDSSD03C 032217	5 / 14	0.57	TCEQ Benchmark (2017)	0	0.37	Eliminated HQ < 1
SW6020	Thallium	7440-28-0	No	0.288 J	0.12	mg/kg	EDSSD08-000-111810	10 / 14	NA	NA	NA	NA	Retained, no screening benchmark
SW6020	Vanadium	7440-62-2	No	19.8	0.12	mg/kg	EDSSD03C 032217	14 / 14	NA	NA	NA	NA	Retained, no screening benchmark
SW6020	Zinc	7440-66-6	Yes	545	0.42	mg/kg	EDSSD03D 032217	14 / 14	121	TCEQ Benchmark (2017)	2	4.5	Retained detected bioaccumulative; HQ>1
SW7471	Mercury	7439-97-6	Yes	0.25	0.00037	mg/kg	EDSSD03D 032217	14 / 14	0.18	TCEQ Benchmark (2017)	1	1.4	Retained detected bioaccumulative; HQ>1
SW8081	4,4'-DDD	72-54-8	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.00488	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.00316	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	4,4'-DDT	50-29-3	Yes	0.024 JH	0.0043	mg/kg	EDSSD04-000-111810	1 / 9	0.00416	TCEQ Benchmark (2017)	1	5.8	Retained detected bioaccumulative; HQ>1
SW8081	Aldrin	309-00-2	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.002	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	alpha-BHC	319-84-6	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.006	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.0017	mg/kg	ND	0 / 9	0.00324	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	beta-BHC	319-85-7	Yes	0.04 JH	0.0026	mg/kg	EDSSD04-000-111810	1 / 9	0.005	TCEQ Benchmark (2017)	1	8.0	Retained detected bioaccumulative; HQ>1
SW8081	delta-BHC	319-86-8	Yes	ND	0.0017	mg/kg	ND	0 / 9	0.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Dieldrin	60-57-1	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.0019	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	No	ND	0.0026	mg/kg	ND	0 / 9	0.0029	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	No	ND	0.0052	mg/kg	ND	0 / 9	0.014	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	No	ND	0.0052	mg/kg	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8081	Endrin	72-20-8	Yes	ND	0.0052	mg/kg	ND	0 / 9	0.00222	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.0052	mg/kg	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8081	gamma-BHC	58-89-9	Yes	ND	0.0017	mg/kg	ND	0 / 9	0.00237	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	gamma-Chlordane	5103-74-2	Yes	0.028	0.0017	mg/kg	EDSSD04-000-111810	1 / 9	0.00324	TCEQ Benchmark (2017)	1	8.6	Retained detected bioaccumulative; HQ>1
SW8081	Heptachlor	76-44-8	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.0006	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.00247	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	No	ND	0.029	mg/kg	ND	0 / 9	0.019	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	Yes	ND	0.033	mg/kg	ND	0 / 9	0.0001	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.0041	mg/kg	ND	0 / 9	0.007	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	NA	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.0041	mg/kg	ND	0 / 9	0.03	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.0041	mg/kg	ND	0 / 9	0.06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.0031	mg/kg	ND	0 / 9	0.005	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Total PCBs	TPCB	Yes	ND	0.01385	mg/kg	ND	0 / 9	0.0598	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.00086	mg/kg	ND	0 / 14	8.27	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.63	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.00086	mg/kg	ND	0 / 14	2.78	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.98	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.00086	mg/kg	ND	0 / 14	2.32	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethene	75-35-4	No	ND	0.00086	mg/kg	ND	0 / 14	3.74	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,2,4-Trichlorobenzene	120-82-1	No	ND	0.001	mg/kg	ND	0 / 14	0.88	TCEQ Benchmark (2017)	ND	ND	

Table 5
Summary of Detected and Non-detected Constituents for East Ditch Sediment (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,3-Dichlorobenzene	541-73-1	No	ND	0.00086	mg/kg	ND	0 / 14	0.19	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.00086	mg/kg	ND	0 / 14	0.77	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	No	ND	0.0024	mg/kg	ND	0 / 14	25.71	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	2-Hexanone	591-78-6	No	ND	0.0017	mg/kg	ND	0 / 14	4.7	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0017	mg/kg	ND	0 / 14	19.43	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	No	ND	0.0035	mg/kg	ND	0 / 14	60.03	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	No	0.002 J	0.00086	mg/kg	EDSSD03B 032217	1 / 14	0.16	TCEQ Benchmark (2017)	0	0.013	Eliminated HQ < 1
SW8260	Bromodichloromethane	75-27-4	No	ND	0.00086	mg/kg	ND	0 / 14	2.46	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.00086	mg/kg	ND	0 / 14	0.22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0017	mg/kg	ND	0 / 14	0.08	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	ND	0.0017	mg/kg	ND	0 / 14	0.12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.00086	mg/kg	ND	0 / 14	1.2	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.00086	mg/kg	ND	0 / 14	0.74	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0017	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.00086	mg/kg	ND	0 / 14	1.889	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0017	mg/kg	ND	0 / 14	17.8	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.00086	mg/kg	ND	0 / 14	12.28	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.23	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	0.0066	0.00086	mg/kg	EDSSD03B 032217	1 / 14	0.16	Surrogate - Benzene	0	0.041	Eliminated HQ < 1
SW8260	Dibromochloromethane	124-48-1	No	ND	0.00086	mg/kg	ND	0 / 14	0.16	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.00086	mg/kg	ND	0 / 14	3.68	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	0.043	0.001	mg/kg	EDSSD03B 032217	4 / 14	2.63	TCEQ Benchmark (2017)	0	0.016	Eliminated HQ < 1
SW8260	Isopropylbenzene	98-82-8	No	0.016	0.0013	mg/kg	EDSSD03B 032217	1 / 14	8.99	TCEQ Benchmark (2017)	0	0.0018	Eliminated HQ < 1
SW8260	Methyl acetate	79-20-9	No	ND	0.00086	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.00086	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	No	0.0044	0.0015	mg/kg	EDSSD03B 032217	1 / 14	0.16	Surrogate - Benzene	0	0.028	Eliminated HQ < 1
SW8260	Methylene chloride	75-09-2	No	ND	0.0017	mg/kg	ND	0 / 14	15.51	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	No	0.0047	0.0012	mg/kg	EDSSD03B 032217	1 / 14	0.176	TCEQ Benchmark (2017)	0	0.027	Eliminated HQ < 1
SW8260	n-Butylbenzene	104-51-8	No	0.0036	0.00086	mg/kg	EDSSD08-000-111810	1 / 14	1.09	TCEQ Benchmark (2017)	0	0.0033	Eliminated HQ < 1
SW8260	n-Propylbenzene	103-65-1	No	0.0036 J	0.00086	mg/kg	EDSSD08-000-111810	1 / 14	0.72	TCEQ Benchmark (2017)	0	0.0050	Eliminated HQ < 1
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.00086	mg/kg	ND	0 / 14	0.88	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	ND	0.00086	mg/kg	ND	0 / 14	10.24	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.00086	mg/kg	ND	0 / 14	1.21	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.001	mg/kg	ND	0 / 14	2.74	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	0.0049 J	0.00088	mg/kg	EDSSD04-000-111810	2 / 14	6.76	TCEQ Benchmark (2017)	0	0.00072	Eliminated HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.00086	mg/kg	ND	0 / 14	23.95	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.00086	mg/kg	ND	0 / 14	0.23	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.00086	mg/kg	ND	0 / 14	4.56	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.00086	mg/kg	ND	0 / 14	1.69	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.00086	mg/kg	ND	0 / 14	1.96	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	0.017	0.0026	mg/kg	EDSSD03B 032217	2 / 14	4	TCEQ Benchmark (2017)	0	0.0043	Eliminated HQ < 1
SW8270	1,1'-Biphenyl	92-52-4	No	0.007 J	0.015	mg/kg	EDSSD03A 32217	4 / 14	1.1	TCEQ Benchmark (2017)	0	0.0064	Eliminated HQ < 1
SW8270	1-Methylnaphthalene-T	90-12-0	No	0.01 J	0.015	mg/kg	EDSSD03D 32217	5 / 14	0.0202	Surrogate - 2-Methylnaphthalene	0	0.50	Evaluated at Total PAHs
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.019	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.022	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.015	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.022	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.022	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.022	mg/kg	ND	0 / 14	1.34	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.021	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.027	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.021	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L,T	91-57-6	No	0.019	0.018	mg/kg	EDSSD03D 32217	6 / 14	0.0202	TCEQ Benchmark (2017)	0	0.94	Evaluated as LMW and Total PAHs
SW8270	2-Methylphenol	95-48-7	No	ND	0.019	mg/kg	ND	0 / 14	0.5	NOAA SQuIRT	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	No	ND	0.022	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270													

Table 5
Summary of Detected and Non-detected Constituents for East Ditch Sediment (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.022	mg/kg	ND	0 / 14	0.94	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	4-Chloroaniline	106-47-8	No	ND	0.015	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.015	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	4-Nitroaniline	100-01-6	No	ND	0.022	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	4-Nitrophenol	100-02-7	No	ND	0.025	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Acenaphthene-L,T	83-32-9	No	0.0051 J	0.0017	mg/kg	EDSSD03C 032217	1 / 14	0.00671	TCEQ Benchmark (2017)	0	0.76	Evaluated as LMW and Total PAHs
SW8270	Acenaphthylene-L,T	208-96-8	No	0.014	0.015	mg/kg	EDSSD03D 032217	1 / 14	0.00587	TCEQ Benchmark (2017)	1	2.4	Evaluated as LMW and Total PAHs
SW8270	Acetophenone	98-86-2	No	0.031	0.016	mg/kg	EDSSD03B 032217	7 / 14	1.49	Surrogate - Dimethyl phthalate	0	0.021	Eliminated HQ < 1
SW8270	Anthracene-L,T	120-12-7	No	0.018	0.015	mg/kg	EDSSD03C 032217	5 / 14	0.0572	TCEQ Benchmark (2017)	0	0.31	Evaluated as LMW and Total PAHs
SW8270	Benz(a)anthracene-H,T	56-55-3	No	0.094	0.019	mg/kg	EDSSD03D 032217	11 / 14	0.108	TCEQ Benchmark (2017)	0	0.87	Evaluated as HMW and Total PAHs
SW8270	Benzaldehyde	100-52-7	No	0.0087 JL	0.031	mg/kg	EDSSD03-000-111810	2 / 14	0.16	Surrogate - Benzene	0	0.054	Eliminated HQ < 1
SW8270	Benzo(a)pyrene-H,T	50-32-8	No	0.12	0.015	mg/kg	EDSSD03D 032217	12 / 14	0.150	TCEQ Benchmark (2017)	0	0.80	Evaluated as HMW and Total PAHs
SW8270	Benzo(b)fluoranthene-T	205-99-2	No	0.22	0.022	mg/kg	EDSSD03D 032217	12 / 14	0.24	Surrogate - Benzo(k)fluoranthene	0	0.92	Evaluated as Total PAHs
SW8270	Benzo(g,h,i)perylene-T	191-24-2	No	0.1	0.019	mg/kg	EDSSD03D 032217	12 / 14	0.17	NOAA SQuiRT	0	0.59	Evaluated as Total PAHs
SW8270	Benzo(k)fluoranthene-T	207-08-9	No	0.08 JL	0.022	mg/kg	EDSSD03D 032217	11 / 14	0.24	NOAA SQuiRT	0	0.33	Evaluated as Total PAHs
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.016	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.019	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.018	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.57 JL	0.044	mg/kg	EDSSD01-000-111810	12 / 14	0.5	TCEQ Benchmark (2017)	2	1.1	Retained HQ > 1
SW8270	Butyl benzyl phthalate	85-68-7	No	0.092	0.017	mg/kg	EDSSD03B 032217	2 / 14	11	TCEQ Benchmark (2017)	0	0.0084	Eliminated HQ < 1
SW8270	Caprolactam	105-60-2	No	ND	0.016	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Carbazole	86-74-8	No	0.037	0.015	mg/kg	EDSSD03D 032217	3 / 14	0.176	Surrogate - Naphthalene	0	0.21	Eliminated HQ < 1
SW8270	Chrysene-H,T	218-01-9	No	0.2	0.019	mg/kg	EDSSD03D 032217	12 / 14	0.166	TCEQ Benchmark (2017)	1	1.2	Evaluated as HMW and Total PAHs
SW8270	Dibenz(a,h)anthracene-H,T	53-70-3	No	0.026	0.015	mg/kg	EDSSD03D 032217	5 / 14	0.033	TCEQ Benchmark (2017)	0	0.79	Evaluated as HMW and Total PAHs
SW8270	Dibenzofuran	132-64-9	No	0.0069 J	0.015	mg/kg	EDSSD03D 032217	1 / 14	0.2	TCEQ Benchmark (2017)	0	0.035	Eliminated HQ < 1
SW8270	Diethyl phthalate	84-66-2	No	ND	0.022	mg/kg	ND	0 / 14	0.63	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.016	mg/kg	ND	0 / 14	1.49	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Di-n-butyl phthalate	84-74-2	No	0.012 J	0.017	mg/kg	EDSSD03D 032217	1 / 14	11	TCEQ Benchmark (2017)	0	0.0011	Eliminated HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	No	ND	0.019	mg/kg	ND	0 / 14	0.039	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Fluoranthene-H,T	206-44-0	No	0.37	0.015	mg/kg	EDSSD03D 032217	13 / 14	0.423	TCEQ Benchmark (2017)	0	0.87	Evaluated as HMW and Total PAHs
SW8270	Fluorene-L,T	86-73-7	No	0.0055 J	0.015	mg/kg	EDSSD03D 032217	1 / 14	0.0774	TCEQ Benchmark (2017)	0	0.071	Evaluated as LMW and Total PAHs
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.017	mg/kg	ND	0 / 14	0.02	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.029	mg/kg	ND	0 / 14	0.055	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.024	mg/kg	ND	0 / 14	0.067	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	No	ND	0.026	mg/kg	ND	0 / 14	0.225	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	High Molecular Weight PAHs	HPAH	No	1.64	0.098	mg/kg	EDSSD03D 032217	13 / 14	NA	Evaluate as Total PAHs	NA	NA	No screening value, evaluate as Total PAHs
SW8270	Indeno(1,2,3-cd)pyrene-T	193-39-5	No	0.096	0.023	mg/kg	EDSSD03D 032217	10 / 14	0.2	NOAA SQuiRT	0	0.48	Eliminated HQ < 1
SW8270	Isophorone	78-59-1	No	ND	0.02	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Low Molecular Weight PAHs	LPAH	No	0.237	0.12	mg/kg	EDSSD03D 032217	13 / 14	NA	Evaluate as Total PAHs	NA	NA	No screening value, evaluate as Total PAHs
SW8270	Naphthalene-L,T	91-20-3	No	0.012	0.022	mg/kg	EDSSD03D 032217	5 / 14	0.176	TCEQ Benchmark (2017)	0	0.068	Evaluated as LMW and Total PAHs
SW8270	Nitrobenzene	98-95-3	No	ND	0.022	mg/kg	ND	0 / 14	2.10	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.027	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.015	mg/kg	ND	0 / 14	NA		ND	ND	Eliminated; not detected
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.019	mg/kg	ND	0 / 14	1.2	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Phenanthrene-L,T	85-01-8	No	0.16	0.02	mg/kg	EDSSD03D 032217	13 / 14	0.204	TCEQ Benchmark (2017)	0	0.78	Evaluated as LMW and Total PAHs
SW8270	Phenol	108-95-2	No	ND	0.022	mg/kg	ND	0 / 14	0.12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Pyrene-H,T	129-00-0	No	0.33	0.015	mg/kg	EDSSD03D 032217	13 / 14	0.195	TCEQ Benchmark (2017)	1	1.7	Evaluated as HMW and Total PAHs
SW8270	Total PAHs	TPAH	No	1.87	NA	mg/kg	EDSSD08-000-111810	13 / 14	1.61	TCEQ Benchmark (2017)	1	1.2	Retained HQ > 1
SW9014	Cyanide	57-12-5	No	0.99 J	1	mg/kg	EDSSD08-000-111810	1 / 9	NA		NA	NA	Retained, no screening benchmark

L - Low Molecular Weight PAH

H - High Molecular Weight PAH

T - Total PAH

PAH - Polycyclic Aromatic Hydrocarbon

PCB - Polychlorinated Biphenyl NOAA SQuiRT - National Oceanic and Atmospheric Agency Screening Quick Reference Tables

ND - Not Detected, NA - Not Applicable TCEQ - Texas Commission on Environmental Quality

J - Estimated Value

JL - Estimated Value, Biased Low JH - Estimated Value, Biased High

Table 6
Summary of Detected and Non-detected Constituents for East Ditch Riparian Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	No	9390	24	mg/kg	ESSB12-010-010412	8 / 8	NA	None available	NA	NA	Eliminated; average soil pH 8.74
SW6020	Antimony	7440-36-0	No	ND	0.3	mg/kg	ND	0 / 8	5	ORNL Plants	ND	ND	Eliminated; not detected
SW6020	Arsenic	7440-38-2	No	3.45	0.11	mg/kg	ESSB11-010-010412	8 / 8	18	Eco SSL Plants	0	0.19	Eliminated HQ < 1
SW6020	Barium	7440-39-3	No	1310	9.5	mg/kg	ESSB10-010-010412	8 / 8	330	Eco SSL Earthworms	3	4.0	Retained HQ > 1
SW6020	Beryllium	7440-41-7	No	0.679	0.06	mg/kg	ESSB12-010-010412	8 / 8	10	ORNL Plants	0	0.068	Eliminated HQ < 1
SW6020	Cadmium	7440-43-9	Yes	0.456 J	0.055	mg/kg	ESSB11-010-010412	8 / 8	32	Eco SSL Plants	0	0.014	Retained detected bioaccumulative
SW6020	Chromium	7440-47-3	Yes	7.35	0.098	mg/kg	ESSB11-010-010412	8 / 8	0.4	ORNL Earthworms	8	18	Retained detected bioaccumulative; HQ>1
SW6020	Cobalt	7440-48-4	No	4.63	0.076	mg/kg	ESSB12-010-010412	8 / 8	13	Eco SSL Plants	0	0.36	Eliminated HQ < 1
SW6020	Copper	7440-50-8	Yes	13.7	0.17	mg/kg	ESSB10-010-010412	8 / 8	70	Eco SSL Plants	0	0.20	Retained detected bioaccumulative
SW6020	Lead	7439-92-1	Yes	84.8	0.06	mg/kg	ESSB10-010-010412	8 / 8	120	Eco SSL Plants	0	0.71	Retained detected bioaccumulative
SW6020	Manganese	7439-96-5	No	297	11	mg/kg	ESSB12-010-010412	8 / 8	220	Eco SSL Plants	2	1.4	Retained HQ > 1
SW6020	Nickel	7440-02-0	Yes	6.95	0.098	mg/kg	ESSB11-010-010412	8 / 8	38	Eco SSL Plants	0	0.18	Retained detected bioaccumulative
SW6020	Selenium	7782-49-2	Yes	1.43	0.53	mg/kg	ESSB11-010-010412	5 / 8	0.52	Eco SSL Plants	5	2.8	Retained detected bioaccumulative; HQ>1
SW6020	Silver	7440-22-4	Yes	ND	0.087	mg/kg	ND	0 / 8	560	Eco SSL Plants	ND	ND	Eliminated; not detected
SW6020	Thallium	7440-28-0	No	0.174 J	0.188	mg/kg	ESSS01-000-101210	2 / 8	1.0	ORNL Plants	0	0.17	Eliminated HQ < 1
SW6020	Vanadium	7440-62-2	No	13.8	0.25	mg/kg	ESSB12-010-010412	8 / 8	2.0	ORNL Plants	0	6.9	Retained HQ > 1
SW6020	Zinc	7440-66-6	Yes	72.9	0.3	mg/kg	ESSB10-010-010412	8 / 8	120	Eco SSL Earthworms	0	0.61	Retained detected bioaccumulative
SW7471	Mercury	7439-97-6	Yes	0.0244	0.00034	mg/kg	ESSB12-010-010412	8 / 8	0.10	ORNL Earthworms	0	0.24	Retained detected bioaccumulative
SW8081	4,4'-DDD	72-54-8	Yes	ND	0.00064	mg/kg	ND	0 / 8	0.758	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.00064	mg/kg	ND	0 / 8	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	4,4'-DDT	50-29-3	Yes	0.0029 J	0.00064	mg/kg	ESSS02-000-101210	1 / 8	0.021	Eco SSL Mammals	0	0.14	Retained detected bioaccumulative
SW8081	Aldrin	309-00-2	Yes	ND	0.00038	mg/kg	ND	0 / 8	0.00332	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	alpha-BHC	319-84-6	Yes	ND	0.00038	mg/kg	ND	0 / 8	0.0994	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.00025	mg/kg	ND	0 / 8	0.224	ORNL Plants	ND	ND	Eliminated; not detected
SW8081	beta-BHC	319-85-7	Yes	ND	0.00038	mg/kg	ND	0 / 8	0.00398	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	delta-BHC	319-86-8	Yes	ND	0.00025	mg/kg	ND	0 / 8	9.94	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Dieldrin	60-57-1	Yes	ND	0.00064	mg/kg	ND	0 / 8	0.0049	Eco SSL Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	No	ND	0.00038	mg/kg	ND	0 / 8	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	No	ND	0.00076	mg/kg	ND	0 / 8	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	No	ND	0.00076	mg/kg	ND	0 / 8	0.0358	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endrin	72-20-8	Yes	ND	0.00076	mg/kg	ND	0 / 8	0.0101	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.00076	mg/kg	ND	0 / 8	0.0105	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	gamma-BHC	58-89-9	Yes	ND	0.00025	mg/kg	ND	0 / 8	0.005	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	gamma-Chlordane	5103-74-2	Yes	ND	0.00025	mg/kg	ND	0 / 8	0.224	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	Heptachlor	76-44-8	Yes	ND	0.00038	mg/kg	ND	0 / 8	0.00598	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.00038	mg/kg	ND	0 / 8	0.152	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	No	ND	0.0043	mg/kg	ND	0 / 8	0.0199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	Yes	ND	0.0058	mg/kg	ND	0 / 8	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.0031	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.0023	mg/kg	ND	0 / 8	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Total PCBs	TPCB	Yes	ND	0.01045	mg/kg	ND	0 / 8	40	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.00077	mg/kg	ND	0 / 8	225	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.0019	mg/kg	ND	0 / 8	29.8	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.00063	mg/kg	ND	0 / 8	0.127	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.0014	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.0022	mg/kg	ND	0 / 8	28.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.00063	mg/kg	ND	0 / 8	20.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethene	75-35-4	No	ND	0.0017	mg/kg	ND	0 / 8	8.28	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,2,4-Trichlorobenzene	120-82-1	No	ND	0.00099	mg/kg	ND	0 / 8	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	1,2,4-Trimethylbenzene	95-63-6	No	ND	0.00088	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,2-Dib												

Table 6
Summary of Detected and Non-detected Constituents for East Ditch Riparian Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.00077	mg/kg	ND	0 / 8	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	No	ND	0.0024	mg/kg	ND	0 / 8	89.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	2-Hexanone	591-78-6	No	ND	0.0019	mg/kg	ND	0 / 8	12.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0013	mg/kg	ND	0 / 8	443	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	No	ND	0.0051	mg/kg	ND	0 / 8	2.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	No	ND	0.00066	mg/kg	ND	0 / 8	0.255	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromodichloromethane	75-27-4	No	ND	0.00066	mg/kg	ND	0 / 8	0.54	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.00077	mg/kg	ND	0 / 8	15.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0013	mg/kg	ND	0 / 8	0.235	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	ND	0.0018	mg/kg	ND	0 / 8	0.0941	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.0013	mg/kg	ND	0 / 8	2.98	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.00063	mg/kg	ND	0 / 8	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0013	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.002	mg/kg	ND	0 / 8	1.19	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0013	mg/kg	ND	0 / 8	10.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.0017	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.00063	mg/kg	ND	0 / 8	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	ND	0.0013	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dibromochloromethane	124-48-1	No	ND	0.00063	mg/kg	ND	0 / 8	2.05	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.002	mg/kg	ND	0 / 8	39.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	ND	0.00099	mg/kg	ND	0 / 8	5.16	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Isopropylbenzene	98-82-8	No	ND	0.0011	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl acetate	79-20-9	No	ND	0.0011	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.0021	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	No	ND	0.0017	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylene chloride	75-09-2	No	0.0049 J	0.0028	mg/kg	ESSB11-010-010412	4 / 8	4.05	EPA Region V Mammals	0	0.0012	Eliminated HQ < 1
SW8260	Naphthalene	91-20-3	No	ND	0.00088	mg/kg	ND	0 / 8	0.0994	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	n-Butylbenzene	104-51-8	No	ND	0.00066	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	No	ND	0.00099	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.00066	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	ND	0.00066	mg/kg	ND	0 / 8	300	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.00066	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.0011	mg/kg	ND	0 / 8	9.92	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	ND	0.00077	mg/kg	ND	0 / 8	200	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.00099	mg/kg	ND	0 / 8	0.784	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.00063	mg/kg	ND	0 / 8	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.0018	mg/kg	ND	0 / 8	12.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.00088	mg/kg	ND	0 / 8	16.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.0011	mg/kg	ND	0 / 8	0.646	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	ND	0.0029	mg/kg	ND	0 / 8	10	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8270	1,1'-Biphenyl	92-52-4	No	ND	0.0037	mg/kg	ND	0 / 8	60	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	1-Methylnaphthalene	90-12-0	No	0.0031 J	0.0029	mg/kg	ESSB10-010-010412	3 / 8	3.24	Surrogate - 2-Methylnaphthalene	0	0.0010	Eliminated HQ < 1
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.0036	mg/kg	ND	0 / 8	4.0	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.0042	mg/kg	ND	0 / 8	10	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.0028	mg/kg	ND	0 / 8	87.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.0042	mg/kg	ND	0 / 8	0.010	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.0042	mg/kg	ND	0 / 8	20	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.0042	mg/kg	ND	0 / 8	6.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.0041	mg/kg	ND	0 / 8	5.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.0052	mg/kg	ND	0 / 8	0.0122	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.0041	mg/kg	ND	0 / 8	0.243	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L	91-57-6	No	0.0066 J	0.0034	mg/kg	ESSB11-010-010412	4 / 8	3.24	EPA Region V Mammals	0	0.0020	Evaluated as LMW PAHs
SW8270	2-Methylphenol	95-48-7	No	ND	0.0037	mg/kg	ND	0 / 8	40.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	No	ND	0.0042	mg/kg	ND	0 / 8	74.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Nitrophenol	88-75-5	No	ND	0.0059	mg/kg	ND	0 / 8	1.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	3&4-Methylphenol	106-44-5	No	0.0024 J	0.0036	mg/kg	ESSB10-010-010412	1 / 8	3.49	EPA Region V Mammals	0	6.9E-04	Eliminated HQ < 1
SW8270	3,3'-Dichlorobenzidine	91-94-1	No	ND	0.0039	mg/kg	ND	0 / 8	0.646	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	3-Nitroaniline	99-09-2	No	ND	0.0033	mg/kg	ND	0 / 8	3.16	EPA Region V Mammals			

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Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	4-Chloroaniline	106-47-8	No	ND	0.0028	mg/kg	ND	0 / 8	1.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.0028	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Nitroaniline	100-01-6	No	ND	0.0042	mg/kg	ND	0 / 8	21.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Nitrophenol	100-02-7	No	ND	0.0048	mg/kg	ND	0 / 8	7.0	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Acenaphthene - L	83-32-9	No	0.0021 J	0.0028	mg/kg	ESSB10-000-010412	1 / 8	20	ORNL Plants	0	1.1E-04	Evaluated as LMW PAHs
SW8270	Acenaphthylene - L	208-96-8	No	ND	0.0028	mg/kg	ND	0 / 8	682	EPA Region V Mammals	ND	ND	Evaluated as LMW PAHs
SW8270	Acetophenone	98-86-2	No	ND	0.01	mg/kg	ND	0 / 8	300	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Anthracene-L	120-12-7	No	0.0047 J	0.0028	mg/kg	ESSB10-010-010412	4 / 8	1480	EPA Region V Mammals	0	3.2E-06	Evaluated as LMW PAHs
SW8270	Benz(a)anthracene-H	56-55-3	No	0.025	0.0036	mg/kg	ESSB10-010-010412	7 / 8	5.21	EPA Region V Mammals	0	0.0048	Evaluated as HMW PAH
SW8270	Benzaldehyde	100-52-7	No	0.01	0.0059	mg/kg	ESSB11-010-010412	4 / 8	0.255	Surrogate - Benzene	0	0.039	Eliminated HQ < 1
SW8270	Benzo(a)pyrene-H	50-32-8	No	0.027	0.0029	mg/kg	ESSB10-010-010412	7 / 8	1.52	EPA Region V Mammals	0	0.018	Evaluated as HMW PAH
SW8270	Benzo(b)fluoranthene	205-99-2	No	0.032	0.0042	mg/kg	ESSB10-010-010412	7 / 8	59.8	EPA Region V Mammals	0	5.4E-04	Eliminated HQ < 1
SW8270	Benzo(g,h,i)perylene	191-24-2	No	0.024	0.0037	mg/kg	ESSB10-010-010412	7 / 8	119	EPA Region V Mammals	0	2.0E-04	Eliminated HQ < 1
SW8270	Benzo(k)fluoranthene	207-08-9	No	0.014	0.0042	mg/kg	ESSB10-010-010412	6 / 8	148	EPA Region V Mammals	0	9.5E-05	Eliminated HQ < 1
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.0031	mg/kg	ND	0 / 8	0.302	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.0036	mg/kg	ND	0 / 8	23.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.0034	mg/kg	ND	0 / 8	19.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.015	0.0084	mg/kg	ESSB12-010-010412	3 / 8	0.925	EPA Region V Mammals	0	0.016	Eliminated HQ < 1
SW8270	Butyl benzyl phthalate	85-68-7	No	0.0054 J	0.0034	mg/kg	ESSS12-000-010412	2 / 8	0.239	EPA Region V Mammals	0	0.023	Eliminated HQ < 1
SW8270	Caprolactam	105-60-2	No	0.0047 J	0.0031	mg/kg	ESSB12-010-010412	1 / 8	0.255	Surrogate - Benzene	0	0.018	Eliminated HQ < 1
SW8270	Carbazole	86-74-8	No	0.0036 J	0.0028	mg/kg	ESSB10-010-010412	4 / 8	0.0994	Surrogate - Naphthalene	0	0.036	Eliminated HQ < 1
SW8270	Chrysene-H	218-01-9	No	0.027	0.0037	mg/kg	ESSB10-010-010412	6 / 8	4.73	EPA Region V Mammals	0	0.0057	Evaluated as HMW PAH
SW8270	Dibenz(a,h)anthracene-H	53-70-3	No	0.0042 J	0.0028	mg/kg	ESSS12-000-010412	4 / 8	18.4	EPA Region V Mammals	0	2.3E-04	Evaluated as HMW PAH
SW8270	Dibenzofuran	132-64-9	No	ND	0.0028	mg/kg	ND	0 / 8	NA	NA	ND	ND	Eliminated; not detected
SW8270	Diethyl phthalate	84-66-2	No	ND	0.0042	mg/kg	ND	0 / 8	100	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.0031	mg/kg	ND	0 / 8	200	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Di-n-butyl phthalate	84-74-2	No	0.0065 J	0.004	mg/kg	ESSS12-000-010412	1 / 8	200	ORNL Plants	0	3.3E-05	Eliminated HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	No	ND	0.0037	mg/kg	ND	0 / 8	709	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Fluoranthene-H	206-44-0	No	0.036	0.0028	mg/kg	ESSB10-010-010412	8 / 8	122	EPA Region V Mammals	0	3.0E-04	Evaluated as HMW PAH
SW8270	Fluorene-L	86-73-7	No	0.0024 J	0.0028	mg/kg	ESSB10-010-010412	1 / 8	30	ORNL Earthworms	0	8.0E-05	Evaluated as LMW PAHs
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.0033	mg/kg	ND	0 / 8	0.199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.0056	mg/kg	ND	0 / 8	0.0398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.0046	mg/kg	ND	0 / 8	10	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	No	ND	0.005	mg/kg	ND	0 / 8	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	High Molecular Weight PAHs	HPAH	No	0.1522	NA	mg/kg	ESSB10-010-010412	8 / 8	1.1	Eco SSL Mammals	0	0.14	Eliminated HQ < 1
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	No	0.022	0.0045	mg/kg	ESSB10-010-010412	7 / 8	109	EPA Region V Mammals	0	2.0E-04	Eliminated HQ < 1
SW8270	Isophorone	78-59-1	No	ND	0.0038	mg/kg	ND	0 / 8	139	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Low Molecular Weight PAHs	LPAH	No	0.0389	NA	mg/kg	ESSB10-010-010412	8 / 8	29	Eco SSL Earthworms	0	0.0013	Eliminated HQ < 1
SW8270	Naphthalene-L	91-20-3	No	0.0043 J	0.0042	mg/kg	ESSS12-000-010412	4 / 8	0.0994	EPA Region V Mammals	0	0.043	Evaluated as LMW PAHs
SW8270	Nitrobenzene	98-95-3	No	ND	0.0042	mg/kg	ND	0 / 8	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.0051	mg/kg	ND	0 / 8	0.544	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.0028	mg/kg	ND	0 / 8	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.0036	mg/kg	ND	0 / 8	5.0	Eco SSL Plants	ND	ND	Eliminated; not detected
SW8270	Phenanthrene-L	85-01-8	No	0.021	0.0038	mg/kg	ESSB10-010-010412	6 / 8	45.7	EPA Region V Mammals	0	4.6E-04	Evaluated as LMW PAHs
SW8270	Phenol	108-95-2	No	ND	0.0042	mg/kg	ND	0 / 8	30	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Pyrene-H	129-00-0	No	0.036	0.0031	mg/kg	ESSB10-010-010412	6 / 8	78.5	EPA Region V Mammals	0	4.6E-04	Evaluated as HMW PAH
SW9014	Cyanide	57-12-5	No	4.55	0.76	mg/kg	ESSS12-000-010412	5 / 8	1.33	EPA Region V Mammals	2	3.4	Retained HQ > 1

This table lists all soil data (0-0.5 ft and 1-2 ft soil depths) combined for the East Ditch Riparian exposure area and screen data against soil benchmarks using maximum detected concentration.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

HMW PAHs and LMW PAHs screened as a class and not individual constituents.

Table 21 summarizes the COPCs in soil from the East Ditch Riparian exposure area for further evaluation.

L - denotes Low Molecular Weight PAH

PCB - Polychlorinated Biphenyl

ORNL - Oak Ridge National Laboratory

ND - Not Detected

H - denotes High Molecular Weight PAH

J - Estimated Value

EPA - Environmental Protection Agency

NA - Not Applicable

PAH - Polycyclic Aromatic Hydrocarbon

JL - Estimated Value, Biased Low

SSL - Soil Screening Levels

Table 7
Summary of Detected and Non-detected Constituents for East Ditch Sediment as Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	No	14200	34	mg/kg	EDSSD01-000-111810	14 / 14	NA	None available	NA	NA	Eliminated; average soil pH 8.74
SW6020	Antimony	7440-36-0	No	0.369 J	0.42	mg/kg	EDSSD03C 032217	1 / 14	5	ORNL Plants	0	0.074	Eliminated HQ < 1
SW6020	Arsenic	7440-38-2	No	3.93	0.1	mg/kg	EDSSD03D 032217	14 / 14	18	Eco SSL Plants	0	0.22	Eliminated HQ < 1
SW6020	Barium	7440-39-3	No	2690	13	mg/kg	EDSSD03C 032217	14 / 14	330	Eco SSL Earthworms	13	8.2	Retained HQ > 1
SW6020	Beryllium	7440-41-7	No	0.621 J	0.084	mg/kg	EDSSD03C 032217	14 / 14	10	ORNL Plants	0	0.062	Eliminated HQ < 1
SW6020	Cadmium	7440-43-9	Yes	0.626 J	0.067	mg/kg	EDSSD03D 032217	14 / 14	32	Eco SSL Plants	0	0.020	Retained detected bioaccumulative
SW6020	Chromium	7440-47-3	Yes	11.9	0.084	mg/kg	EDSSD03C 032217	14 / 14	0.4	ORNL Earthworms	14	30	Retained detected bioaccumulative; HQ>1
SW6020	Cobalt	7440-48-4	No	6.82	0.05	mg/kg	EDSSD02-000-111810	14 / 14	13	Eco SSL Plants	0	0.52	Eliminated HQ < 1
SW6020	Copper	7440-50-8	Yes	21.5	0.23	mg/kg	EDSSD03C 032217	14 / 14	70	Eco SSL Plants	0	0.31	Retained detected bioaccumulative
SW6020	Lead	7439-92-1	Yes	77	0.084	mg/kg	EDSSD08-000-111810	14 / 14	120	Eco SSL Plants	0	0.64	Retained detected bioaccumulative
SW6020	Manganese	7439-96-5	No	559	12	mg/kg	EDSSD02-000-111810	14 / 14	220	Eco SSL Plants	10	2.5	Retained HQ > 1
SW6020	Nickel	7440-02-0	Yes	8.53	0.1	mg/kg	EDSSD03C 032217	14 / 14	38	Eco SSL Plants	0	0.22	Retained detected bioaccumulative
SW6020	Selenium	7782-49-2	Yes	0.757 J	0.42	mg/kg	EDSSD01-000-111810	12 / 14	0.52	Eco SSL Plants	4	1.5	Retained detected bioaccumulative; HQ>1
SW6020	Silver	7440-22-4	Yes	0.213 J	0.067	mg/kg	EDSSD03C 032217	5 / 14	560	Eco SSL Plants	0	3.8E-04	Retained detected bioaccumulative
SW6020	Thallium	7440-28-0	No	0.288 J	0.12	mg/kg	EDSSD08-000-111810	10 / 14	1.0	ORNL Plants	0	0.29	Eliminated HQ < 1
SW6020	Vanadium	7440-62-2	No	19.8	0.12	mg/kg	EDSSD03C 032217	14 / 14	2.0	ORNL Plants	14	9.9	Retained HQ > 1
SW6020	Zinc	7440-66-6	Yes	545	0.42	mg/kg	EDSSD03D 032217	14 / 14	120	Eco SSL Earthworms	2	4.5	Retained detected bioaccumulative; HQ>1
SW7471	Mercury	7439-97-6	Yes	0.25	0.00037	mg/kg	EDSSD03D 032217	14 / 14	0.10	ORNL Earthworms	2	2.5	Retained detected bioaccumulative; HQ>1
SW8081	4,4'-DDD	72-54-8	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.758	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	4,4'-DDT	50-29-3	Yes	0.024 JH	0.0043	mg/kg	EDSSD04-000-111810	1 / 9	0.021	Eco SSL Mammals	1	1.1	Retained detected bioaccumulative; HQ>1
SW8081	Aldrin	309-00-2	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.00332	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	alpha-BHC	319-84-6	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.0994	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.0017	mg/kg	ND	0 / 9	0.224	ORNL Plants	ND	ND	Eliminated; not detected
SW8081	beta-BHC	319-85-7	Yes	0.04 JH	0.0026	mg/kg	EDSSD04-000-111810	1 / 9	0.00398	EPA Region V Plants	1	10	Retained detected bioaccumulative; HQ>1
SW8081	delta-BHC	319-86-8	Yes	ND	0.0017	mg/kg	ND	0 / 9	9.94	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Dieldrin	60-57-1	Yes	ND	0.0043	mg/kg	ND	0 / 9	0.0049	Eco SSL Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	No	ND	0.0026	mg/kg	ND	0 / 9	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	No	ND	0.0052	mg/kg	ND	0 / 9	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	No	ND	0.0052	mg/kg	ND	0 / 9	0.0358	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endrin	72-20-8	Yes	ND	0.0052	mg/kg	ND	0 / 9	0.0101	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.0052	mg/kg	ND	0 / 9	0.0105	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	gamma-BHC	58-89-9	Yes	ND	0.0017	mg/kg	ND	0 / 9	0.005	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8081	gamma-Chlordane	5103-74-2	Yes	0.028	0.0017	mg/kg	EDSSD04-000-111810	1 / 9	0.224	EPA Region V Plants	0	0.13	Retained detected bioaccumulative
SW8081	Heptachlor	76-44-8	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.00598	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.0026	mg/kg	ND	0 / 9	0.152	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	No	ND	0.029	mg/kg	ND	0 / 9	0.0199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	Yes	ND	0.033	mg/kg	ND	0 / 9	0.119	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.0041	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.0031	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Total PCBs	TPCB	Yes	ND	0.01385	mg/kg	ND	0 / 9	40	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.00086	mg/kg	ND	0 / 14	225	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.00086	mg/kg	ND	0 / 14	29.8	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.127	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.00086	mg/kg	ND	0 / 14	28.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.00086	mg/kg	ND	0 / 14	20.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethene	75-35-4	No	ND	0.00086	mg/kg	ND	0 / 14	8.28	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,2,4-Trichlorobenzene	120-82-1	No	ND	0.001	mg/kg	ND	0 / 14	20	ORNL Earthworms	ND	ND	Eliminated

Table 7
Summary of Detected and Non-detected Constituents for East Ditch Sediment as Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,3,5-Trimethylbenzene	108-67-8	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,3-Dichlorobenzene	541-73-1	No	ND	0.00086	mg/kg	ND	0 / 14	37.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.00086	mg/kg	ND	0 / 14	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	No	ND	0.0024	mg/kg	ND	0 / 14	89.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	2-Hexanone	591-78-6	No	ND	0.0017	mg/kg	ND	0 / 14	12.6	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0017	mg/kg	ND	0 / 14	443	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	No	ND	0.0035	mg/kg	ND	0 / 14	2.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	No	0.002 J	0.00086	mg/kg	EDSSD03B 032217	1 / 14	0.255	EPA Region V Mammals	0	0.0078	Eliminated HQ < 1
SW8260	Bromodichloromethane	75-27-4	No	ND	0.00086	mg/kg	ND	0 / 14	0.54	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.00086	mg/kg	ND	0 / 14	15.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0017	mg/kg	ND	0 / 14	0.235	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	ND	0.0017	mg/kg	ND	0 / 14	0.0941	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.00086	mg/kg	ND	0 / 14	2.98	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.00086	mg/kg	ND	0 / 14	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0017	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.00086	mg/kg	ND	0 / 14	1.19	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0017	mg/kg	ND	0 / 14	10.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	0.0066	0.00086	mg/kg	EDSSD03B 032217	1 / 14	0.255	Surrogate - Benzene	0	0.026	Eliminated HQ < 1
SW8260	Dibromochloromethane	124-48-1	No	ND	0.00086	mg/kg	ND	0 / 14	2.05	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.00086	mg/kg	ND	0 / 14	39.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	0.043	0.001	mg/kg	EDSSD03B 032217	4 / 14	5.16	EPA Region V Mammals	0	0.0083	Eliminated HQ < 1
SW8260	Isopropylbenzene	98-82-8	No	0.016	0.0013	mg/kg	EDSSD03B 032217	1 / 14	0.255	Surrogate - Benzene	0	0.063	Eliminated HQ < 1
SW8260	Methyl acetate	79-20-9	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	No	0.0044	0.0015	mg/kg	EDSSD03B 032217	1 / 14	0.255	Surrogate - Benzene	0	0.017	Eliminated HQ < 1
SW8260	Methylene chloride	75-09-2	No	ND	0.0017	mg/kg	ND	0 / 14	4.05	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	No	0.0047	0.0012	mg/kg	EDSSD03B 032217	1 / 14	0.0994	EPA Region V Mammals	0	0.047	Eliminated HQ < 1
SW8260	n-Butylbenzene	104-51-8	No	0.0036	0.00086	mg/kg	EDSSD08-000-111810	1 / 14	0.255	Surrogate - Benzene	0	0.014	Eliminated HQ < 1
SW8260	n-Propylbenzene	103-65-1	No	0.0036 J	0.00086	mg/kg	EDSSD08-000-111810	1 / 14	0.255	Surrogate - Benzene	0	0.014	Eliminated HQ < 1
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	ND	0.00086	mg/kg	ND	0 / 14	300	ORNL Plants	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.00086	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.001	mg/kg	ND	0 / 14	9.92	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	0.0049 J	0.00088	mg/kg	EDSSD04-000-111810	2 / 14	200	ORNL Plants	0	2.5E-05	Eliminated HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.00086	mg/kg	ND	0 / 14	0.784	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.00086	mg/kg	ND	0 / 14	0.398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.00086	mg/kg	ND	0 / 14	12.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.00086	mg/kg	ND	0 / 14	16.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.00086	mg/kg	ND	0 / 14	0.646	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	0.017	0.0026	mg/kg	EDSSD03B 032217	2 / 14	10	EPA Region V Plants	0	0.0017	Eliminated HQ < 1
SW8270	1,1'-Biphenyl	92-52-4	No	0.007 J	0.015	mg/kg	EDSSD03A 32217	4 / 14	60	ORNL Plants	0	1.2E-04	Eliminated HQ < 1
SW8270	1-Methylnaphthalene	90-12-0	No	0.01 J	0.015	mg/kg	EDSSD03D 32217	5 / 14	3.24	Surrogate - 2-Methylnaphthalene	0	0.0031	Eliminated HQ < 1
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.019	mg/kg	ND	0 / 14	4.0	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.022	mg/kg	ND	0 / 14	10	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.015	mg/kg	ND	0 / 14	87.5	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.022	mg/kg	ND	0 / 14	0.010	EPA Region V Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.022	mg/kg	ND	0 / 14	20	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.022	mg/kg	ND	0 / 14	6.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.021	mg/kg	ND	0 / 14	5.0	TCEQ Benchmark	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.027	mg/kg	ND	0 / 14	0.0122	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.021	mg/kg	ND	0 / 14	0.243	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L	91-57-6	No	0.019	0.018	mg/kg	EDSSD03D 32217	6 / 14	3.24	EPA Region V Mammals	0	0.0059	Eliminated HQ < 1
SW8270	2-Methylphenol	95-48-7	No	ND	0.019	mg/kg	ND	0 / 14	40.4	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	No	ND									

Table 7
Summary of Detected and Non-detected Constituents for East Ditch Sediment as Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	No	ND	0.022	mg/kg	ND	0 / 14	0.144	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Bromophenyl phenyl ether	101-55-3	No	ND	0.022	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.022	mg/kg	ND	0 / 14	7.95	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Chloroaniline	106-47-8	No	ND	0.015	mg/kg	ND	0 / 14	1.1	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.015	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Nitroaniline	100-01-6	No	ND	0.022	mg/kg	ND	0 / 14	21.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	4-Nitrophenol	100-02-7	No	ND	0.025	mg/kg	ND	0 / 14	7.0	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Acenaphthene - L	83-32-9	No	0.0051 J	0.0017	mg/kg	EDSSD03C 032217	1 / 14	20	ORNL Plants	0	2.6E-04	Evaluated as LMW PAHs
SW8270	Acenaphthylene - L	208-96-8	No	0.014	0.015	mg/kg	EDSSD03D 032217	1 / 14	682	EPA Region V Mammals	0	2.1E-05	Evaluated as LMW PAHs
SW8270	Acetophenone	98-86-2	No	0.031	0.016	mg/kg	EDSSD03B 032217	7 / 14	300	EPA Region V Mammals	0	1.0E-04	Eliminated HQ < 1
SW8270	Anthracene-L	120-12-7	No	0.018	0.015	mg/kg	EDSSD03C 032217	5 / 14	1480	EPA Region V Mammals	0	1.2E-05	Evaluated as LMW PAHs
SW8270	Benz(a)anthracene-H	56-55-3	No	0.094	0.019	mg/kg	EDSSD03D 032217	11 / 14	5.21	EPA Region V Mammals	0	0.018	Evaluated as HMW PAHs
SW8270	Benzaldehyde	100-52-7	No	0.0087 JL	0.031	mg/kg	EDSSD03-000-111810	2 / 14	0.255	Surrogate - Benzene	0	0.034	Eliminated HQ < 1
SW8270	Benzo(a)pyrene-H	50-32-8	No	0.12	0.015	mg/kg	EDSSD03D 032217	12 / 14	1.52	EPA Region V Mammals	0	0.079	Evaluated as HMW PAHs
SW8270	Benzo(b)fluoranthene	205-99-2	No	0.22	0.022	mg/kg	EDSSD03D 032217	12 / 14	59.8	EPA Region V Mammals	0	0.0037	Eliminated HQ < 1
SW8270	Benzo(g,h,i)perylene	191-24-2	No	0.1	0.019	mg/kg	EDSSD03D 032217	12 / 14	119	EPA Region V Mammals	0	8.4E-04	Eliminated HQ < 1
SW8270	Benzo(k)fluoranthene	207-08-9	No	0.08 JL	0.022	mg/kg	EDSSD03D 032217	11 / 14	148	EPA Region V Mammals	0	5.4E-04	Eliminated HQ < 1
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.016	mg/kg	ND	0 / 14	0.302	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.019	mg/kg	ND	0 / 14	23.7	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.018	mg/kg	ND	0 / 14	19.9	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.57 JL	0.044	mg/kg	EDSSD01-000-111810	12 / 14	0.925	EPA Region V Mammals	0	0.62	Eliminated HQ < 1
SW8270	Butyl benzyl phthalate	85-68-7	No	0.092	0.017	mg/kg	EDSSD03B 032217	2 / 14	0.239	EPA Region V Mammals	0	0.38	Eliminated HQ < 1
SW8270	Caprolactam	105-60-2	No	ND	0.016	mg/kg	ND	0 / 14	NA	NA	ND	ND	Eliminated; not detected
SW8270	Carbazole	86-74-8	No	0.037	0.015	mg/kg	EDSSD03D 032217	3 / 14	0.0994	Surrogate - Naphthalene	0	0.37	Eliminated HQ < 1
SW8270	Chrysene-H	218-01-9	No	0.2	0.019	mg/kg	EDSSD03D 032217	12 / 14	4.73	EPA Region V Mammals	0	0.042	Evaluated as HMW PAHs
SW8270	Dibenz(a,h)anthracene-H	53-70-3	No	0.026	0.015	mg/kg	EDSSD03D 032217	5 / 14	18.4	EPA Region V Mammals	0	0.0014	Evaluated as HMW PAHs
SW8270	Dibenzofuran	132-64-9	No	0.0069 J	0.015	mg/kg	EDSSD03D 032217	1 / 14	0.0994	Surrogate - Naphthalene	0	0.069	Eliminated HQ < 1
SW8270	Diethyl phthalate	84-66-2	No	ND	0.022	mg/kg	ND	0 / 14	100	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.016	mg/kg	ND	0 / 14	200	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Di-n-butyl phthalate	84-74-2	No	0.012 J	0.017	mg/kg	EDSSD03D 032217	1 / 14	200	ORNL Plants	0	6.0E-05	Eliminated HQ < 1
SW8270	Di-n-octyl phthalate	117-84-0	No	ND	0.019	mg/kg	ND	0 / 14	709	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Fluoranthene-H	206-44-0	No	0.37	0.015	mg/kg	EDSSD03D 032217	13 / 14	122	EPA Region V Mammals	0	0.0030	Evaluated as HMW PAHs
SW8270	Fluorene-L	86-73-7	No	0.0055 J	0.015	mg/kg	EDSSD03D 032217	1 / 14	30	ORNL Earthworms	0	1.8E-04	Evaluated as LMW PAHs
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.017	mg/kg	ND	0 / 14	0.199	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.029	mg/kg	ND	0 / 14	0.0398	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.024	mg/kg	ND	0 / 14	10	ORNL Plants	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	No	ND	0.026	mg/kg	ND	0 / 14	0.596	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	High Molecular Weight PAHs	HPAH	No	1.64	0.098	mg/kg	EDSSD03D 032217	14 / 14	1.1	Eco SSL Mammals	1	1.5	Retained HQ > 1
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	No	0.096	0.023	mg/kg	EDSSD03D 032217	10 / 14	109	EPA Region V Mammals	0	8.8E-04	Eliminated HQ < 1
SW8270	Isothorone	78-59-1	No	ND	0.02	mg/kg	ND	0 / 14	139	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	Low Molecular Weight PAHs	LPAH	No	0.237	0.12	mg/kg	EDSSD03D 032217	14 / 14	29	Eco SSL Earthworms	0	0.0082	Eliminated HQ < 1
SW8270	Naphthalene-L	91-20-3	No	0.012	0.022	mg/kg	EDSSD03D 032217	5 / 14	0.0994	EPA Region V Mammals	0	0.12	Evaluated as LMW PAHs
SW8270	Nitrobenzene	98-95-3	No	ND	0.022	mg/kg	ND	0 / 14	40	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.027	mg/kg	ND	0 / 14	0.544	EPA Region V Mammals	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.015	mg/kg	ND	0 / 14	20	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.019	mg/kg	ND	0 / 14	5.0	Eco SSL Plants	ND	ND	Eliminated; not detected
SW8270	Phenanthrene-L	85-01-8	No	0.16	0.02	mg/kg	EDSSD03D 032217	13 / 14	45.7	EPA Region V Mammals	0	0.0035	Evaluated as LMW PAHs
SW8270	Phenol	108-95-2	No	ND	0.022	mg/kg	ND	0 / 14	30	ORNL Earthworms	ND	ND	Eliminated; not detected
SW8270	Pyrene-H	129-00-0	No	0.33	0.015	mg/kg	EDSSD03D 032217	13 / 14	78.5	EPA Region V Mammals	0	0.0042	Evaluated as HMW PAHs
SW9014	Cyanide	57-12-5	No	0.99 J	1	mg/kg	EDSSD08-000-111810	1 / 9	1.33	EPA Region V Mammals	0	0.74	Eliminated HQ < 1

This table lists all soil data (0-0.5 ft soil depth) for the East Ditch Sediment as Soil exposure area and data are screened against soil benchmarks using maximum detected concentration.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

HMW PAHs and LMW PAHs screened as a class and not individual constituents.

Table 22 summarizes the COPCs in soil from the East Ditch Sediment as Soil exposure area for further evaluation.

L - denotes Low Molecular Weight PAH

PCB - Polychlorinated Biphenyl

Table 8
Summary of Detected and Non-detected Constituents for East Ditch Sediment (North)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Max Detection (mg/kg)	Max Detection Limit	Units	Sample with Max Detection	Detections Count	Sediment Marine Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	No	10000	40	mg/kg	EDNSD08-000-111710	22 / 22	18000	NOAA SQuRT	0	0.56	Eliminated HQ < 1
SW6020	Antimony	7440-36-0	No	ND	0.5	mg/kg	ND	0 / 22	2	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW6020	Arsenic	7440-38-2	No	37.8	0.19	mg/kg	EDDS02-000-111610	22 / 22	8.2	TCEQ Benchmark (2017)	6	4.6	Retained HQ > 1
SW6020	Barium	7440-39-3	No	4730	16	mg/kg	EDDS02-000-111610	22 / 22	130.1	NOAA SQuRT	22	36	Retained HQ > 1
SW6020	Beryllium	7440-41-7	No	0.541 J	0.1	mg/kg	EDNSD02-000-111710	22 / 22	NA	NA	NA	NA	Retained, no benchmark available
SW6020	Cadmium	7440-43-9	Yes	3.76	0.097	mg/kg	EDDS04-000-111610	22 / 22	1.2	TCEQ Benchmark (2017)	9	3.1	Retained detected bioaccumulative; HQ>1
SW6020	Chromium	7440-47-3	No	12.2	0.17	mg/kg	EDSD07-000-013112	22 / 22	81	TCEQ Benchmark (2017)	0	0.15	Eliminated HQ < 1
SW6020	Cobalt	7440-48-4	No	14.5	0.14	mg/kg	EDDS08-000-111610	22 / 22	10	NOAA SQuRT	1	1.5	Retained HQ > 1
SW6020	Copper	7440-50-8	Yes	91.5	0.28	mg/kg	EDSD09-000-013112	22 / 22	34	TCEQ Benchmark (2017)	1	2.7	Retained detected bioaccumulative; HQ>1
SW6020	Lead	7439-92-1	No	225	4.7	mg/kg	EDNSS01-000-111710	22 / 22	46.7	TCEQ Benchmark (2017)	6	4.8	Retained HQ > 1
SW6020	Manganese	7439-96-5	No	2590	19	mg/kg	EDSD09-000-013112	22 / 22	260	NOAA SQuRT	12	10	Retained HQ > 1
SW6020	Nickel	7440-02-0	Yes	9.75	0.17	mg/kg	EDDS09-000-111610	22 / 22	20.9	TCEQ Benchmark (2017)	0	0.47	Retained detected bioaccumulative
SW6020	Selenium	7782-49-2	Yes	1.39	0.5	mg/kg	EDNSD08-000-111710	21 / 22	1.0	NOAA SQuRT	3	1.4	Retained detected bioaccumulative; HQ>1
SW6020	Silver	7440-22-4	No	0.337 J	0.16	mg/kg	EDNSD02-000-111710	13 / 22	1.0	TCEQ Benchmark (2017)	0	0.34	Eliminated HQ < 1
SW6020	Thallium	7440-28-0	No	0.297 J	0.14	mg/kg	EDDS08-000-111610	12 / 22	NA	NA	NA	NA	Retained, no benchmark available
SW6020	Vanadium	7440-62-2	No	14.1	0.45	mg/kg	EDNSD08-000-111710	22 / 22	57	NOAA SQuRT	0	0.25	Eliminated HQ < 1
SW6020	Zinc	7440-66-6	Yes	408	40	mg/kg	EDNSD02-000-111710	22 / 22	150	TCEQ Benchmark (2017)	14	2.7	Retained detected bioaccumulative; HQ>1
SW7471	Mercury	7439-97-6	Yes	0.533	0.00061	mg/kg	EDNSD08-000-111710	22 / 22	0.15	TCEQ Benchmark (2017)	10	3.6	Retained detected bioaccumulative; HQ>1
SW8081	4,4'-DDD	72-54-8	Yes	0.012	0.011	mg/kg	EDNSD08-000-111710	1 / 22	0.00122	TCEQ Benchmark (2017)	1	9.8	Eliminated; detected < 5%
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.011	mg/kg	ND	0 / 22	0.00207	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	4,4'-DDT	50-29-3	Yes	ND	0.011	mg/kg	ND	0 / 22	0.00119	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Aldrin	309-00-2	Yes	ND	0.0068	mg/kg	ND	0 / 22	0.0095	NOAA SQuRT	ND	ND	Eliminated; not detected
SW8081	alpha-BHC	319-84-6	Yes	0.027 J	0.0068	mg/kg	EDDS08-000-111610	1 / 22	0.00032	TCEQ Benchmark (2017) gamma-BHC as surrogate	NA	84	Eliminated, detected < 5%
SW8081	alpha-Chlordane	5103-71-9	Yes	0.011 J	0.0045	mg/kg	EDNSD06-000-111710	1 / 22	0.00226	TCEQ Benchmark (2017)	1	4.9	Eliminated, detected < 5%
SW8081	beta-BHC	319-85-7	Yes	0.015 J	0.0068	mg/kg	EDDS03-000-111610	1 / 22	0.00032	TCEQ Benchmark (2017) gamma-BHC as surrogate	NA	47	Eliminated, detected < 5%
SW8081	delta-BHC	319-86-8	Yes	0.029 J	0.0045	mg/kg	EDDS08-000-111610	1 / 22	0.00032	TCEQ Benchmark (2017) gamma-BHC as surrogate	NA	91	Eliminated, detected < 5%
SW8081	Dieldrin	60-57-1	Yes	ND	0.011	mg/kg	ND	0 / 22	0.00071	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8081	Endosulfan I	959-98-8	No	ND	0.0068	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8081	Endosulfan II	33213-65-9	No	ND	0.014	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8081	Endosulfan sulfate	1031-07-8	No	0.023 J	0.014	mg/kg	EDSD09-000-013112	2 / 22	NA	NA	NA	NA	Retained, no benchmark available
SW8081	Endrin	72-20-8	Yes	0.011 J	0.014	mg/kg	EDDS03-000-111610	1 / 22	0.00267	TCEQ Benchmark (2017)	1	4.1	Eliminated, detected < 5%
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.014	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8081	gamma-BHC	58-89-9	Yes	0.017 J	0.0045	mg/kg	EDDS07-000-111610	1 / 22	0.00032	TCEQ Benchmark (2017)	1	53	Eliminated, detected < 5%
SW8081	gamma-Chlordane	5103-74-2	Yes	0.014 J	0.0045	mg/kg	EDDS09-000-111610	1 / 22	0.00226	TCEQ Benchmark (2017)	1	6.2	Eliminated, detected < 5%
SW8081	Heptachlor	76-44-8	Yes	0.023 J	0.0068	mg/kg	EDDS08-000-111610	2 / 22	0.0006	TCEQ Benchmark (2017)	2	38	Retained detected bioaccumulative; HQ>1
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.0068	mg/kg	ND	0 / 22	0.00274	NOAA SQuRT	ND	ND	Eliminated; not detected
SW8081	Methoxychlor	72-43-5	No	ND	0.077	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8081	Toxaphene	8001-35-2	Yes	ND	0.1	mg/kg	ND	0 / 22	0.0001	NOAA SQuRT	ND	ND	Eliminated; not detected
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.05	mg/kg	ND	0 / 22	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.05	mg/kg	ND	0 / 22	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.05	mg/kg	ND	0 / 22	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.05	mg/kg	ND	0 / 22	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.05	mg/kg	ND	0 / 22	NA	Evaluate as Total PCBs	ND	ND	Eliminated; not detected
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.05	mg/kg	ND	0 / 22	0.0633	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8082	Aroclor 1260	11096-82-5	Yes	0.011 J	0.037	mg/kg	EDNSS01-000-111710	1 / 22	NA	Evaluate as Total PCBs	NA	NA	Evaluated as Total PCBs
SW8082	Total PCBs	TPCB	Yes	0.0185	0.1685	mg/kg	EDNSS01-000-111710	1 / 22	0.0227	TCEQ Benchmark (2017)	0	0.81	Eliminated, detected < 5%
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.0011	mg/kg	ND	0 / 20	11.95	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.0011	mg/kg	ND	0 / 20	0.61	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.0011	mg/kg	ND	0 / 20	0.3	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	1,1-Dichloroethene	75-35-4	No	ND	0.0011	mg/kg	ND</td						

Table 8
Summary of Detected and Non-detected Constituents for East Ditch Sediment (North)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Max Detection (mg/kg)	Max Detection Limit	Units	Sample with Max Detection	Detections Count	Sediment Marine Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	Acetone	67-64-1	No	ND	0.023	mg/kg	ND	0 / 20	167.23	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	No	ND	0.0011	mg/kg	ND	0 / 20	1.36	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromodichloromethane	75-27-4	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	No	ND	0.0011	mg/kg	ND	0 / 20	1.78	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	No	ND	0.0023	mg/kg	ND	0 / 20	0.42	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	No	0.013 J	0.0023	mg/kg	EDDSD05-000-FD-111610	5 / 20	1.36	Surrogate - Benzene	0	0.010	Eliminated HQ < 1
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.0011	mg/kg	ND	0 / 20	12.25	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	No	ND	0.0011	mg/kg	ND	0 / 20	2.73	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	No	ND	0.0023	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	No	ND	0.0011	mg/kg	ND	0 / 20	2.95	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	No	ND	0.0023	mg/kg	ND	0 / 20	8.74	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.0011	mg/kg	ND	0 / 20	0.98	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.0011	mg/kg	ND	0 / 20	0.04	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dibromochloromethane	124-48-1	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	No	ND	0.0011	mg/kg	ND	0 / 20	1.37	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Isopropylbenzene	98-82-8	No	0.0052 J	0.0011	mg/kg	EDNSD07-000-111710	2 / 20	1.36	Surrogate - Benzene	0	0.0038	Eliminated HQ < 1
SW8260	Methyl acetate	79-20-9	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Methylene chloride	75-09-2	No	ND	0.0023	mg/kg	ND	0 / 20	7.65	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	No	0.0019 J	0.0011	mg/kg	EDNSS01-000-111710	1 / 20	0.16	TCEQ Benchmark (2017)	0	0.012	Eliminated HQ < 1
SW8260	n-Butylbenzene	104-51-8	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Styrene	100-42-5	No	ND	0.0011	mg/kg	ND	0 / 20	3.72	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	No	ND	0.0014	mg/kg	ND	0 / 20	1.07	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	No	ND	0.0011	mg/kg	ND	0 / 20	2.58	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.0011	mg/kg	ND	0 / 20	0.98	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.0011	mg/kg	ND	0 / 20	0.04	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	No	ND	0.0011	mg/kg	ND	0 / 20	2.43	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	No	ND	0.0011	mg/kg	ND	0 / 20	NA	NA	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	No	ND	0.0034	mg/kg	ND	0 / 20	2.54	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	1,1'-Biphenyl	92-52-4	No	ND	0.066	mg/kg	ND	0 / 22	0.073	NOAA SQuiRT	ND	ND	Eliminated; not detected
SW8270	1-Methylnaphthalene-T	90-12-0	No	0.0043 J	0.052	mg/kg	EDDSD10-000-11160	1 / 22	0.07	Surrogate - 2-Methylnaphthalene	0	0.061	Evaluated as Total PAHs
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.064	mg/kg	ND	0 / 22	0.003	NOAA SQuiRT	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.075	mg/kg	ND	0 / 22	0.006	NOAA SQuiRT	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.05	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.075	mg/kg	ND	0 / 22	0.029	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.075	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.075	mg/kg	ND	0 / 22	9.46	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.073	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.093	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	No	ND	0.073	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene-L,T	91-57-6	No	0.031 J	0.061	mg/kg	EDSD07-000-013112	3 / 22	0.07	TCEQ Benchmark (2017)	0	0.44	Evaluated as LMW and Total PAHs
SW8270	2-Methylphenol	95-48-7	No	ND	0.066	mg/kg	ND	0 / 22	0.063	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Nitroaniline	88-74-4	No	ND	0.075	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	2-Nitrophenol	88-75-5	No	ND	0.1	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	3&4-Methylphenol	106-44-5	No	0.032 J	0.064	mg/kg	EDSD07-000-013112	2 / 22	0.67	TCEQ Benchmark (2017)	0	0.048	Eliminated HQ < 1
SW8270	3,3'-Dichlorobenzidine	91-94-1	No	ND	0.07	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	3-Nitroaniline	99-09-2	No	ND	0.059	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	No	ND	0.075	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Bromophenyl phenyl ether	101-55-3	No	ND	0.075	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.075	mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Chloroaniline	106-47-8	No	ND	0.05	mg/kg</							

Table 8
Summary of Detected and Non-detected Constituents for East Ditch Sediment (North)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Max Detection (mg/kg)	Max Detection Limit	Units	Sample with Max Detection	Detections Count	Sediment Marine Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	Benzaldehyde	100-52-7	No	0.14 JL	0.1 mg/kg	EDNSD02-000-111710	5 / 22	1.36	Surrogate - Benzene	0	0.10	Eliminated HQ < 1	
SW8270	Benzo(a)pyrene-H,T	50-32-8	No	5 JL	0.052 mg/kg	EDDS09-000-111610	15 / 22	0.43	TCEQ Benchmark (2017)	3	12	Evaluated as HMW and Total PAHs	
SW8270	Benzo(b)fluoranthene-T	205-99-2	No	4.6 JL	0.075 mg/kg	EDDS09-000-111610	18 / 22	1.107	NOAA SQuRT	2	4.2	Evaluated as Total PAHs	
SW8270	Benzo(g,h,i)perylene-T	191-24-2	No	3.1 JL	0.066 mg/kg	EDDS09-000-111610	16 / 22	0.497	NOAA SQuRT	2	6.2	Evaluated as Total PAHs	
SW8270	Benzo(k)fluoranthene-T	207-08-9	No	4	0.51 mg/kg	EDDS09-000-111610	18 / 22	0.537	NOAA SQuRT	2	7.4	Evaluated as Total PAHs	
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.054 mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.064 mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.061 mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	1.6	0.15 mg/kg	EDSD07-000-013112	14 / 22	0.182	TCEQ Benchmark (2017)	1	8.8	Retained HQ > 1	
SW8270	Butyl benzyl phthalate	85-68-7	No	0.013	0.057 mg/kg	EDNSD08-000-111710	2 / 22	0.049	TCEQ Benchmark (2017)	0	0.27	Eliminated HQ < 1	
SW8270	Caprolactam	105-60-2	No	0.027 JL	0.054 mg/kg	EDNSD05-000-111710	1 / 22	1.36	Surrogate - Benzene	0	0.020	Eliminated HQ < 1	
SW8270	Carbazole	86-74-8	No	0.77 JL	0.05 mg/kg	EDDS09-000-111610	13 / 22	0.16	Surrogate -Naphthalene	2	4.8	Retained HQ > 1	
SW8270	Chrysene-H,T	218-01-9	No	7.1	0.44 mg/kg	EDDS09-000-111610	19 / 22	0.384	TCEQ Benchmark (2017)	3	18	Evaluuated as HMW and Total PAHs	
SW8270	Dibenz(a,h)anthracene-H,T	53-70-3	No	1.1 JL	0.05 mg/kg	EDDS09-000-111610	7 / 22	0.0634	TCEQ Benchmark (2017)	4	17	Evaluuated as HMW and Total PAHs	
SW8270	Dibenzo furan	132-64-9	No	0.11 JL	0.05 mg/kg	EDDS09-000-111610	3 / 22	0.15	TCEQ Benchmark (2017)	0	0.73	Eliminated HQ < 1	
SW8270	Diethyl phthalate	84-66-2	No	0.009 J	0.075 mg/kg	EDDS10-000-11160	2 / 22	0.61	TCEQ Benchmark (2017)	0	0.015	Eliminated HQ < 1	
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.054 mg/kg	ND	0 / 22	0.53	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Di-n-butyl phthalate	84-74-2	No	0.097 J	0.057 mg/kg	EDSD07-000-013112	3 / 22	2.2	TCEQ Benchmark (2017)	0	0.044	Eliminated HQ < 1	
SW8270	Di-n-octyl phthalate	117-84-0	No	0.085	0.066 mg/kg	EDDS03-000-111610	1 / 22	0.58	TCEQ Benchmark (2017)	0	0.15	Eliminated HQ < 1	
SW8270	Fluoranthene-H,T	206-44-0	No	12	0.34 mg/kg	EDDS09-000-111610	22 / 22	0.6	TCEQ Benchmark (2017)	5	20	Evaluuated as HMW and Total PAHs	
SW8270	Fluorene-L,T	86-73-7	No	0.27 JL	0.05 mg/kg	EDDS09-000-111610	4 / 22	0.019	TCEQ Benchmark (2017)	2	14	Evaluuated as LMW and Total PAHs	
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.059 mg/kg	ND	0 / 22	0.006	NOAA SQuRT	ND	ND	Eliminated; not detected	
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.1 mg/kg	ND	0 / 22	0.022	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.082 mg/kg	ND	0 / 22	0.36	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Hexachloroethane	67-72-1	No	ND	0.089 mg/kg	ND	0 / 22	1.86	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	High Molecular Weight PAHs	HPAH	No	40.1	NA mg/kg	EDDS09-000-111610	22 / 22	1.7	TCEQ Benchmark (2017)	3	24	Retained HQ > 1	
SW8270	Indeno(1,2,3-cd)pyrene-T	193-39-5	No	3.5 JL	0.079 mg/kg	EDDS09-000-111610	15 / 22	0.488	NOAA SQuRT	2	7.2	Evaluuated as Total PAHs	
SW8270	Isophorone	78-59-1	No	ND	0.068 mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected	
SW8270	Low Molecular Weight PAHs	LPAH	No	5.605	NA mg/kg	EDDS09-000-111610	22 / 22	0.552	TCEQ Benchmark (2017)	4	10	Retained HQ > 1	
SW8270	Naphthalene-L,T	91-20-3	No	0.027 J	0.075 mg/kg	EDSD07-000-013112	1 / 20	0.16	TCEQ Benchmark (2017)	0	0.17	Evaluuated as LMW and Total PAHs	
SW8270	Nitrobenzene	98-95-3	No	ND	0.075 mg/kg	ND	0 / 22	2.67	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.091 mg/kg	ND	0 / 22	NA	NA	ND	ND	Eliminated; not detected	
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.05 mg/kg	ND	0 / 22	0.028	NOAA SQuRT	ND	ND	Eliminated; not detected	
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.064 mg/kg	ND	0 / 22	0.36	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Phenanthrene-L,T	85-01-8	No	4.3 JL	0.068 mg/kg	EDDS09-000-111610	16 / 22	0.24	TCEQ Benchmark (2017)	2	18	Evaluuated as HMW and Total PAHs	
SW8270	Phenol	108-95-2	No	ND	0.075 mg/kg	ND	0 / 22	0.42	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8270	Pyrene-H,T	129-00-0	No	9.1	0.34 mg/kg	EDDS09-000-111610	21 / 22	0.665	TCEQ Benchmark (2017)	3	14	Evaluuated as HMW and Total PAHs	
SW8270	Total PAHs	TPAH	No	60.94	NA mg/kg	EDDS09-000-111610	22 / 22	4.022	TCEQ Benchmark (2017)	3	15	Retained HQ > 1	
SW9014	Cyanide	57-12-5	No	3.03 J	1.3 mg/kg	EDDS05-000-FD-111610	4 / 20	NA	NA	NA	NA	Retained, no benchmark available	

L - Low Molecular Weight PAH

H - High Molecular Weight PAH

T - Total PAH

PAH - Polycyclic Aromatic Hydrocarbon

PCB - Polychlorinated Biphenyl

ND - Not Detected, NA - Not Applicable

J - Estimated Value

JL - Estimated Value, Biased Low

NOAA SQuRT - National Oceanic and Atmospheric Agency Screening Quick Reference Tables

TCEQ - Texas Commission on Environmental Quality

RG263 - Conducting Ecological Risk Assessments at Remediation Sites in Texas, 2014

Table 9
Summary of Detected and Non-Detected Constituents for Groundwater Potentially Discharging to South Segment of the East Ditch
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated	
SW6020	Aluminum	7429-90-5	T	No	0.0483	NA	mg/l	MWGW02-170118	1 / 1	0.087	TCEQ Benchmark (2017)	0	0.56	Eliminated; HQ < 1	
SW6020	Antimony	7440-36-0	T	No	0.00244	J	NA	mg/l	MWGW02-170118	1 / 1	2.20	TCEQ Benchmark (2017)	0	0.0011	Eliminated; HQ < 1
SW6020	Arsenic	7440-38-2	T	No	0.122	NA	mg/l	MWGW02-170118	1 / 1	0.15	TCEQ Benchmark (2017)	0	0.81	Eliminated; HQ < 1	
SW6020	Barium	7440-39-3	T	No	0.381	NA	mg/l	MWGW02-170118	1 / 1	16	TCEQ Benchmark (2017)	0	0.024	Eliminated; HQ < 1	
SW6020	Beryllium	7440-41-7	T	No	0.00093	J	NA	mg/l	MWGW02-170118	1 / 1	0.0053	TCEQ Benchmark (2017)	0	0.18	Eliminated; HQ < 1
SW6020	Cadmium	7440-43-9	D	No	0.00057	J	NA	mg/l	MWGW02-170118	1 / 1	0.000341	Texas RBEL hardness specific	1	1.7	Retained; HQ > 1
SW6020	Chromium	7440-47-3	D	No	0.174	NA	mg/l	MWGW02-170118	1 / 1	0.109	Texas RBEL hardness specific	1	1.6	Retained; HQ > 1	
SW6020	Cobalt	7440-48-4	T	No	0.00566	J	NA	mg/l	MWGW02-170118	1 / 1	1.5	TCEQ Benchmark (2017)	0	0.0038	Eliminated; HQ < 1
SW6020	Copper	7440-50-8	D	No	0.0403	NA	mg/l	MWGW02-170118	1 / 1	0.0141	Texas RBEL hardness specific	1	2.9	Retained; HQ > 1	
SW6020	Lead	7439-92-1	D	No	0.0162	NA	mg/l	MWGW02-170118	1 / 1	0.00418	Texas RBEL hardness specific	1	3.9	Retained; HQ > 1	
SW6020	Manganese	7439-96-5	T	No	0.162	NA	mg/l	MWGW02-170118	1 / 1	1.93	Texas RBEL hardness specific	0	0.084	Eliminated; HQ < 1	
SW6020	Nickel	7440-02-0	D	No	0.0828	NA	mg/l	MWGW02-170118	1 / 1	0.0774	Texas RBEL hardness specific	1	1.1	Retained; HQ > 1	
SW6020	Selenium	7782-49-2	T	Yes	0.00383	J	NA	mg/l	MWGW02-170118	1 / 1	0.005	TCEQ Benchmark (2017)	0	0.77	Retained detected bioaccumulative
SW6020	Silver	7440-22-4	D	No	ND	0.0004	mg/l	ND	0 / 1	0.0001	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW6020	Thallium	7440-28-0	T	Yes	ND	0.0004	mg/l	ND	0 / 1	0.18	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW6020	Vanadium	7440-62-2	T	No	0.0667	NA	mg/l	MWGW02-170118	1 / 1	0.02	TCEQ Benchmark (2017)	1	3.3	Retained; HQ > 1	
SW6020	Zinc	7440-66-6	D	No	0.0807	NA	mg/l	MWGW02-170118	1 / 1	0.176	Texas RBEL hardness specific	0	0.46	Eliminated; HQ < 1	
SW7470	Mercury	7439-97-6	T	Yes	0.00015	J	NA	mg/l	MWGW02-170118	1 / 1	0.0013	TCEQ Benchmark (2017)	0	0.12	Retained; detected bioaccumulative
SW8081	4,4'-DDD	72-54-8	N	Yes	ND	0.0012	mg/l	ND	0 / 1	1.10E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	4,4'-DDE	72-55-9	N	Yes	ND	0.0012	mg/l	ND	0 / 1	1.10E-04	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	4,4'-DDT	50-29-3	N	Yes	ND	0.0012	mg/l	ND	0 / 1	1.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Aldrin	309-00-2	N	No	ND	0.00062	mg/l	ND	0 / 1	0.0003	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	alpha-BHC	319-84-6	N	No	0.0075	NA	mg/l	MWGW02-140227	1 / 1	0.074	TCEQ Benchmark (2017)	0	0.10	Eliminated; HQ < 1	
SW8081	alpha-Chlordane	5103-71-9	N	No	ND	0.0012	mg/l	ND	0 / 4	4.0E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	beta-BHC	319-85-7	N	No	ND	0.00062	mg/l	ND	0 / 4	0.083	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	delta-BHC	319-86-8	N	No	ND	0.00062	mg/l	ND	0 / 4	0.141	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Dieldrin	60-57-1	N	No	0.0049	NA	mg/l	MWGW02-140227	1 / 1	2.00E-06	TCEQ Benchmark (2017)	1	2450	Retained; HQ > 1	
SW8081	Endosulfan I	959-98-8	N	No	ND	0.00062	mg/l	ND	0 / 1	5.60E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Endosulfan II	33213-65-9	N	No	ND	0.0012	mg/l	ND	0 / 1	5.60E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Endosulfan sulfate	1031-07-8	N	No	ND	0.0012	mg/l	ND	0 / 1	5.60E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Endrin	72-20-8	N	No	ND	0.0012	mg/l	ND	0 / 1	2.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Endrin aldehyde	7421-93-4	N	No	ND	0.0012	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected	
SW8081	gamma-BHC	58-89-9	N	No	0.0021	NA	mg/l	MWGW02-140227	1 / 1	8.00E-05	TCEQ Benchmark (2017)	1	26	Retained; HQ > 1	
SW8081	gamma-Chlordane	5103-74-2	N	No	ND	0.0012	mg/l	ND	0 / 1	4.00E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Heptachlor	76-44-8	N	No	0.0025	NA	mg/l	MWGW02-140227	1 / 1	4.00E-06	TCEQ Benchmark (2017)	1	625	Retained; HQ > 1	
SW8081	Heptachlor epoxide	1024-57-3	N	No	ND	0.00062	mg/l	ND	0 / 1	3.80E-06	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Methoxychlor	72-43-5	N	No	ND	0.0062	mg/l	ND	0 / 1	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8081	Toxaphene	8001-35-2	N	No	ND	0.012	mg/l	ND	0 / 1	2.00E-07	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1016	12674-11-2	N	Yes	ND	0.01	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1221	11104-28-2	N	Yes	ND	0.05	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1232	11141-16-5	N	Yes	ND	0.05	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1242	53469-21-9	N	Yes	ND	0.05	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1248	12672-29-6	N	Yes	ND	0.05	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1254	11097-69-1	N	Yes	ND	0.05	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Aroclor 1260	11096-82-5	N	Yes	ND	0.01	mg/l	ND	0 / 1	1.40E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8082	Total PCBs	TPCB	N	Yes	ND	NA	mg/l	ND	0 / 1	3.00E-05	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	N	No	ND	0.0015	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected	
SW8260	1,1,1-Trichloroethane	71-55-6	N	No	ND	0.001	mg/l	ND	0 / 1	4.91	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	N	No	ND	0.0025	mg/l	ND	0 / 1	0.465	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	N	No	ND	0.005	mg/l	ND	0 / 1	0.207	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8260	1,1,2-Trichloroethane	79-00-5	N	No	ND	0.0015	mg/l	ND	0 / 1	0.90	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected	
SW8260	1,1-Dichloroethane	75-34-3	N	No	ND	0.001	mg/l	ND	0 / 1						

Table 9
Summary of Detected and Non-Detected Constituents for Groundwater Potentially Discharging to South Segment of the East Ditch
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8260	1,3-Dichlorobenzene	541-73-1	N	No	ND	0.002	mg/l	ND	0 / 1	0.085	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	1,4-Dichlorobenzene	106-46-7	N	No	ND	0.002	mg/l	ND	0 / 1	0.11	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	2-Butanone	78-93-3	N	No	ND	0.0025	mg/l	ND	0 / 1	42.4	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	2-Hexanone	591-78-6	N	No	ND	0.005	mg/l	ND	0 / 1	6.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	4-Methyl-2-pentanone	108-10-1	N	No	ND	0.0035	mg/l	ND	0 / 1	26.40	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Acetone	67-64-1	N	No	ND	0.01	mg/l	ND	0 / 1	101.2	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Benzene	71-43-2	N	No	0.53	NA	mg/l	MWGW02-170118	1 / 1	0.13	TCEQ Benchmark (2017)	1	4.1	Retained; HQ > 1
SW8260	Bromodichloromethane	75-27-4	N	No	ND	0.001	mg/l	ND	0 / 1	2.16	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromoform	75-25-2	N	No	ND	0.002	mg/l	ND	0 / 1	0.149	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Bromomethane	74-83-9	N	No	ND	0.002	mg/l	ND	0 / 1	0.11	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon disulfide	75-15-0	N	No	ND	0.003	mg/l	ND	0 / 1	0.105	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Carbon tetrachloride	56-23-5	N	No	ND	0.0025	mg/l	ND	0 / 1	0.0098	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chlorobenzene	108-90-7	N	No	ND	0.0015	mg/l	ND	0 / 1	0.064	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloroethane	75-00-3	N	No	ND	0.0015	mg/l	ND	0 / 1	NA		ND	ND	Eliminated; not detected
SW8260	Chloroform	67-66-3	N	No	ND	0.001	mg/l	ND	0 / 1	1.79	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Chloromethane	74-87-3	N	No	ND	0.001	mg/l	ND	0 / 1	28	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,2-Dichloroethene	156-59-2	N	No	ND	0.001	mg/l	ND	0 / 1	14	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	cis-1,3-Dichloropropene	10061-01-5	N	No	ND	0.0005	mg/l	ND	0 / 1	0.205	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Cyclohexane	110-82-7	N	No	0.053	NA	mg/l	MWGW02-170118	1 / 1	0.13	Surrogate - Benzene	0	0.41	Eliminated; HQ < 1
SW8260	Dibromochloromethane	124-48-1	N	No	ND	0.0015	mg/l	ND	0 / 1	0.129	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Dichlorodifluoromethane	75-71-8	N	No	ND	0.0015	mg/l	ND	0 / 1	1.963	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Ethylbenzene	100-41-4	N	No	2	NA	mg/l	MWGW02-170118	1 / 1	1.00	TCEQ Benchmark (2017)	1	2.0	Retained; HQ > 1
SW8260	Isopropylbenzene	98-82-8	N	No	0.17	NA	mg/l	MWGW02-170118	1 / 1	0.255	TCEQ Benchmark (2017)	0	0.67	Eliminated; HQ < 1
SW8260	Methyl acetate	79-20-9	N	No	ND	0.005	mg/l	ND	0 / 1	NA		ND	ND	Eliminated; not detected
SW8260	Methyl tert-butyl ether	1634-04-4	N	No	ND	0.001	mg/l	ND	0 / 1	51	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Methylcyclohexane	108-87-2	N	No	0.07	NA	mg/l	MWGW02-170118	1 / 1	0.13	Surrogate - Benzene	0	0.54	Eliminated HQ < 1
SW8260	Methylene chloride	75-09-2	N	No	ND	0.005	mg/l	ND	0 / 1	22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Naphthalene	91-20-3	N	No	0.35	NA	mg/l	MWGW02-170118	1 / 1	0.25	TCEQ Benchmark (2017)	1	1.4	Retained; HQ > 1
SW8260	n-Butylbenzene	104-51-8	N	No	ND	0.002	mg/l	ND	0 / 1	0.036	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	n-Propylbenzene	103-65-1	N	No	0.032	NA	mg/l	MWGW02-170118	1 / 1	0.064	TCEQ Benchmark (2017)	0	0.50	Eliminated; HQ < 1
SW8260	sec-Butylbenzene	135-98-8	N	No	0.012	NA	mg/l	MWGW02-170118	1 / 1	0.041	TCEQ Benchmark (2017)	0	0.29	Eliminated; HQ < 1
SW8260	Styrene	100-42-5	N	No	ND	0.0015	mg/l	ND	0 / 1	1.25	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	tert-Butylbenzene	98-06-6	N	No	ND	0.0015	mg/l	ND	0 / 1	0.048	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Tetrachloroethene	127-18-4	N	No	ND	0.0015	mg/l	ND	0 / 1	1.28	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Toluene	108-88-3	N	No	0.089	NA	mg/l	MWGW02-170118	1 / 1	3.40	TCEQ Benchmark (2017)	0	0.026	Eliminated; HQ < 1
SW8260	trans-1,2-Dichloroethene	156-60-5	N	No	ND	0.001	mg/l	ND	0 / 1	22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	trans-1,3-Dichloropropene	10061-02-6	N	No	ND	0.001	mg/l	ND	0 / 1	0.205	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichloroethene	79-01-6	N	No	ND	0.001	mg/l	ND	0 / 1	3.00	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Trichlorofluoromethane	75-69-4	N	No	ND	0.0015	mg/l	ND	0 / 1	0.871	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Vinyl chloride	75-01-4	N	No	ND	0.001	mg/l	ND	0 / 1	2.82	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8260	Xylenes, Total	1330-20-7	N	No	2.1	NA	mg/l	MWGW02-170118	1 / 1	1.34	TCEQ Benchmark (2017)	1	1.6	Retained; HQ > 1
SW8270	1,1'-Biphenyl	92-52-4	N	No	0.026	NA	mg/l	MWGW02-170118	1 / 1	0.014	TCEQ Benchmark (2017)	1	1.9	Retained; HQ > 1
SW8270	1-Methylnaphthalene	90-12-0	N	No	0.15	NA	mg/l	MWGW02-170118	1 / 1	0.0021	TCEQ Benchmark (2017)	1	71	Retained; HQ > 1
SW8270	2,4,5-Trichlorophenol	95-95-4	N	No	ND	0.000089	mg/l	ND	0 / 1	0.064	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4,6-Trichlorophenol	88-06-2	N	No	ND	0.000075	mg/l	ND	0 / 1	0.0135	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dichlorophenol	120-83-2	N	No	ND	0.000067	mg/l	ND	0 / 1	0.085	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dimethylphenol	105-67-9	N	No	3.6	NA	mg/l	MWGW02-170118	1 / 1	0.105	TCEQ Benchmark (2017)	1	34	Retained; HQ > 1
SW8270	2,4-Dinitrophenol	51-28-5	N	No	ND	0.00016	mg/l	ND	0 / 1	0.031	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,4-Dinitrotoluene	121-14-2	N	No	ND	0.000091	mg/l	ND	0 / 1	1.22	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2,6-Dinitrotoluene	606-20-2	N	No	ND	0.000066	mg/l	ND	0 / 1	NA		ND	ND	Eliminated; not detected
SW8270	2-Chloronaphthalene	91-58-7	N	No	ND	0.000033	mg/l	ND	0 / 1	0.054	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Chlorophenol	95-57-8	N	No	ND	0.000056	mg/l	ND	0 / 1	0.13	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	2-Methylnaphthalene	91-57-6	N	No	0.3	NA	mg/l	MWGW02-170118	1 / 1	0.063	TCEQ Benchmark (2017)	1	4.8 </td	

Table 9
Summary of Detected and Non-Detected Constituents for Groundwater Potentially Discharging to South Segment of the East Ditch
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW8270	4-Bromophenyl phenyl ether	101-55-3	N	No	ND	0.00008	mg/l	ND	0 / 1	0.0015	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	4-Chloro-3-methylphenol	59-50-7	N	No	ND	0.00005	mg/l	ND	0 / 1	0.1	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	4-Chloroaniline	106-47-8	N	No	ND	0.000061	mg/l	ND	0 / 1	0.05	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	N	No	ND	0.000069	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Nitroaniline	100-01-6	N	No	ND	0.000055	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected
SW8270	4-Nitrophenol	100-02-7	N	No	ND	0.000073	mg/l	ND	0 / 1	0.532	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Acenaphthene	83-32-9	N	No	0.0082	NA	mg/l	MWGW02-170118	1 / 1	0.023	TCEQ Benchmark (2017)	0	0.36	Eliminated; HQ < 1
SW8270	Acenaphthylene	208-96-8	N	No	ND	0.000023	mg/l	ND	0 / 1	4.84	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	Acetophenone	98-86-2	N	No	ND	0.000038	mg/l	ND	0 / 1	1.65	Surrogate - Dimethyl phthalate	ND	ND	Eliminated; not detected
SW8270	Anthracene	120-12-7	N	No	0.0018	NA	mg/l	MWGW02-170118	1 / 1	0.0003	TCEQ Benchmark (2017)	1	6.0	Retained; HQ > 1
SW8270	Benz(a)anthracene	56-55-3	N	No	0.0024	NA	mg/l	MWGW02-170118	1 / 1	0.0346	TCEQ Benchmark (2017)	0	0.069	Eliminated; HQ < 1
SW8270	Benzaldehyde	100-52-7	N	No	ND	0.000047	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected
SW8270	Benzo(a)pyrene	50-32-8	N	No	0.0022	NA	mg/l	MWGW02-170118	1 / 1	1.40E-05	TCEQ Benchmark (2017)	1	157	Retained; HQ > 1
SW8270	Benzo(b)fluoranthene	205-99-2	N	No	0.0011	NA	mg/l	MWGW02-170118	1 / 1	0.00907	NOAA SQuiRT Chronic Value	0	0.12	Eliminated; HQ < 1
SW8270	Benzo(g,h,i)perylene	191-24-2	N	No	0.0012	NA	mg/l	MWGW02-170118	1 / 1	0.00764	NOAA SQuiRT Chronic Value	1	0.16	Eliminated; HQ < 1
SW8270	Benzo(k)fluoranthene	207-08-9	N	No	0.00023	NA	mg/l	MWGW02-170118	1 / 1	0.00907	Surrogate - Benzo(b)fluoranthene	0	0.025	Eliminated; HQ < 1
SW8270	Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	0.000047	mg/l	ND	0 / 1	11	NOAA SQuiRT Acute Value	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroethyl)ether	111-44-4	N	No	ND	0.000041	mg/l	ND	0 / 1	12	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	0.00011	mg/l	ND	0 / 1	6.308	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	N	No	0.0021	NA	mg/l	MWGW02-170118	1 / 1	0.02	TCEQ Benchmark (2017)	0	0.11	Eliminated; HQ < 1
SW8270	Butyl benzyl phthalate	85-68-7	N	No	ND	0.00003	mg/l	ND	0 / 1	0.093	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Caprolactam	105-60-2	N	No	ND	0.00007	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected
SW8270	Carbazole	86-74-8	N	No	ND	0.000039	mg/l	ND	0 / 1	NA	NA	ND	ND	Eliminated; not detected
SW8270	Chrysene	218-01-9	N	No	0.0027	NA	mg/l	MWGW02-170118	1 / 1	0.007	TCEQ Benchmark (2017)	0	0.39	Eliminated; HQ < 1
SW8270	Dibenz(a,h)anthracene	53-70-3	N	No	0.00062	NA	mg/l	MWGW02-170118	1 / 1	0.005	TCEQ Benchmark (2017)	0	0.12	Eliminated; HQ < 1
SW8270	Dibenzofuran	132-64-9	N	No	0.0082	NA	mg/l	MWGW02-170118	1 / 1	0.094	TCEQ Benchmark (2017)	0	0.087	Eliminated; HQ < 1
SW8270	Diethyl phthalate	84-66-2	N	No	ND	0.000047	mg/l	ND	0 / 1	1.043	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Dimethyl phthalate	131-11-3	N	No	ND	0.000064	mg/l	ND	0 / 1	1.65	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Di-n-butyl phthalate	84-74-2	N	No	ND	0.000031	mg/l	ND	0 / 1	0.007	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Di-n-octyl phthalate	117-84-0	N	No	ND	0.000031	mg/l	ND	0 / 1	0.022	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Fluoranthene	206-44-0	N	No	0.0016	NA	mg/l	MWGW02-170118	1 / 1	0.00616	TCEQ Benchmark (2017)	0	0.26	Eliminated; HQ < 1
SW8270	Fluorene	86-73-7	N	No	0.012	NA	mg/l	MWGW02-170118	1 / 1	0.011	TCEQ Benchmark (2017)	1	1.1	Retained; HQ > 1
SW8270	Hexachlorobenzene	118-74-1	N	Yes	ND	0.000069	mg/l	ND	0 / 1	0.00368	NOAA SQuiRT Chronic Value	ND	ND	Eliminated; not detected
SW8270	Hexachlorobutadiene	87-68-3	N	No	ND	0.000047	mg/l	ND	0 / 1	0.00436	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachlorocyclopentadiene	77-47-4	N	No	ND	0.000047	mg/l	ND	0 / 1	0.00001	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Hexachloroethane	67-72-1	N	No	ND	0.000092	mg/l	ND	0 / 1	0.012	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	N	No	0.00083	NA	mg/l	MWGW02-170118	1 / 1	0.00431	NOAA SQuiRT Chronic Value	0	0.19	Eliminated; HQ < 1
SW8270	Isophorone	78-59-1	N	No	ND	0.000039	mg/l	ND	0 / 1	6	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Naphthalene	91-20-3	N	No	0.26	NA	mg/l	MWGW02-170118	1 / 1	0.25	TCEQ Benchmark (2017)	1	1.0	Eliminated; HQ = 1
SW8270	Nitrobenzene	98-95-3	N	No	ND	0.000038	mg/l	ND	0 / 1	1.1	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	0.00005	mg/l	ND	0 / 1	0.02	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	N-Nitrosodiphenylamine	86-30-6	N	No	ND	0.000039	mg/l	ND	0 / 1	0.29	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Pentachlorophenol	87-86-5	N	No	ND	0.00012	mg/l	ND	0 / 1	0.00245	TCEQ Benchmark (2017)	ND	ND	Eliminated; not detected
SW8270	Phenanthrene	85-01-8	N	No	0.039	NA	mg/l	MWGW02-170118	1 / 1	0.03	TCEQ Benchmark (2017)	1	1.3	Retained; HQ > 1
SW8270	Phenol	108-95-2	N	No	0.015	NA	mg/l	MWGW02-170118	1 / 1	0.11	TCEQ Benchmark (2017)	1	0.14	Eliminated HQ < 1
SW8270	Pyrene	129-00-0	N	No	0.0045	NA	mg/l	MWGW02-170118	1 / 1	0.007	TCEQ Benchmark (2017)	0	0.64	Eliminated; HQ < 1
SW8270	Total PAHs	TPAH	N	No	0.79	NA	mg/l	MWGW02-170118	1 / 1	NA	NA	NA	NA	Retained; no screening benchmark
SW9014	Cyanide	57-12-5	T	No	0.131	NA	mg/l	MWGW02-140227	1 / 1	0.0107	TCEQ Benchmark (2017)	1	12	Retained; HQ > 1

J - Estimated Value

JL - Estimated Value, Biased Low

T - Total Metals

D - Dissolved Metals

N - Total/Dissolved not applicable

ND - Not Detected

NA - Not Applicable

WQ - Water Quality

RBEL - Risk Based Exposure Limit

Table 10
Summary of Detected and Non Detected Constituents for Groundwater Discharging to North Segment of the East Ditch
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count
Aluminum	7429-90-5	T	No	6.49E-02	0.008	mg/l	MWGW15-022614	3 / 4	0.75	Geometric Mean; EPA Draft Criteria)	0
Antimony	7440-36-0	T	No	ND	0.004	mg/l	ND	0 / 4	0.73	TCEQ Benchmark (2017)	ND
Arsenic	7440-38-2	T	No	1.81E-02	NA	mg/l	MWGW05-022614	4 / 4	0.078	TCEQ Benchmark (2017)	0
Barium	7440-39-3	T	No	7.32E-02	NA	mg/l	MWGW05-022614	4 / 4	25	TCEQ Benchmark (2017)	0
Beryllium	7440-41-7	T	No	ND	0.0035	mg/l	ND	0 / 4	0.10	NOAA SQuiRT British Columbia Chronic Value	ND
Cadmium	7440-43-9	D	No	ND	0.004	mg/l	ND	0 / 4	0.00875	TCEQ Benchmark (2017)	ND
Chromium	7440-47-3	D	No	ND	0.005	mg/l	ND	0 / 4	0.0274	NOAA SQuiRT Australian & New Zealand Chronic	ND
Cobalt	7440-48-4	T	No	3.73E-02	0.0016	mg/l	MWGW16-022614	2 / 4	0.001	NOAA SQuiRT Australian & New Zealand Chronic	2
Copper	7440-50-8	D	No	2.09E-03 J	0.005	mg/l	MWGW15-022614	1 / 4	0.0036	TCEQ Benchmark (2017)	0
Lead	7439-92-1	D	No	ND	0.0035	mg/l	ND	0 / 4	0.0053	TCEQ Benchmark (2017)	ND
Manganese	7439-96-5	D	No	2.13E+00	NA	mg/l	MWGW16-022614	4 / 4	0.10	NOAA SQuiRT British Columbia Chronic Value	4
Nickel	7440-02-0	D	No	1.66E-02 J	0.002	mg/l	MWGW16-022614	3 / 4	0.0131	TCEQ Benchmark (2017)	1
Selenium	7782-49-2	T	Yes	1.26E-02 J	0.002	mg/l	MWGW16-022614	3 / 4	0.136	TCEQ Benchmark (2017)	0
Silver	7440-22-4	D	No	ND	0.004	mg/l	ND	0 / 4	0.00019	TCEQ Benchmark (2017)	ND
Thallium	7440-28-0	T	Yes	ND	0.005	mg/l	ND	0 / 4	2.1	TCEQ Benchmark (2017)	ND
Vanadium	7440-62-2	T	No	3.72E-02	0.0018	mg/l	MWGW15-022614	3 / 4	0.050	NOAA SQuiRT British Columbia Chronic Value	0
Zinc	7440-66-6	D	No	7.89E-03	0.012	mg/l	MWGW05-022614	3 / 4	0.0842	TCEQ Benchmark (2017)	0
Mercury	7439-97-6	T	Yes	ND	4.00E-05	mg/l	ND	0 / 4	0.0011	TCEQ Benchmark (2017)	ND
4,4'-DDD	72-54-8	N	Yes	ND	5.00E-05	mg/l	ND	0 / 4	0.000025	TCEQ Benchmark (2017)	ND
4,4'-DDE	72-55-9	N	Yes	ND	5.00E-05	mg/l	ND	0 / 4	0.0014	NOAA SQuiRT Chronic Value	ND
4,4'-DDT	50-29-3	N	Yes	2.10E-05	5.00E-05	mg/l	MWGW05-022614	1 / 4	1.00E-06	TCEQ Benchmark (2017)	1
Aldrin	309-00-2	N	No	ND	2.50E-05	mg/l	ND	0 / 4	0.00013	TCEQ Benchmark (2017)	ND
alpha-BHC	319-84-6	N	No	ND	2.50E-05	mg/l	ND	0 / 4	0.025	TCEQ Benchmark (2017)	ND
alpha-Chlordane	5103-71-9	N	No	ND	5.00E-05	mg/l	ND	0 / 4	4.00E-06	TCEQ Benchmark (2017)	ND
beta-BHC	319-85-7	N	No	1.60E-05	2.50E-05	mg/l	MWGW15-022614	1 / 4	2.50E-02	TCEQ Benchmark (2017), gamma-BHC as surrogate	0
delta-BHC	319-86-8	N	No	2.00E-05	2.50E-05	mg/l	MWGW15-022614	2 / 4	2.50E-02	TCEQ Benchmark (2017), gamma-BHC as surrogate	0
Dieldrin	60-57-1	N	No	ND	5.00E-05	mg/l	ND	0 / 4	2.00E-06	TCEQ Benchmark (2017)	ND
Endosulfan I	959-98-8	N	No	6.50E-05	1.20E-05	mg/l	MWGW04-022614	3 / 4	9.00E-06	TCEQ Benchmark (2017)	1
Endosulfan II	33213-65-9	N	No	ND	5.00E-05	mg/l	ND	0 / 4	9.00E-06	TCEQ Benchmark (2017)	ND
Endosulfan sulfate	1031-07-8	N	No	2.30E-05	5.00E-05	mg/l	MWGW15-022614	1 / 4	9.00E-06	TCEQ Benchmark (2017)	1
Endrin	72-20-8	N	No	ND	5.00E-05	mg/l	ND	0 / 4	2.00E-06	TCEQ Benchmark (2017)	ND
Endrin aldehyde	7421-93-4	N	No	ND	5.00E-05	mg/l	ND	0 / 4	NA	NA	ND
gamma-BHC	58-89-9	N	No	ND	2.50E-05	mg/l	ND	0 / 4	1.60E-05	TCEQ Benchmark (2017)	ND
gamma-Chlordane	5103-74-2	N	No	6.70E-05	5.00E-05	mg/l	MWGW15-022614	1 / 4	4.00E-06	TCEQ Benchmark (2017)	1
Heptachlor	76-44-8	N	No	3.10E-05	2.50E-05	mg/l	MWGW15-022614	1 / 4	4.00E-06	TCEQ Benchmark (2017)	1
Heptachlor epoxide	1024-57-3	N	No	2.90E-05	2.50E-05	mg/l	MWGW15-022614	1 / 4	3.60E-06	TCEQ Benchmark (2017)	1
Methoxychlor	72-43-5	N	No	ND	2.50E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Toxaphene	8001-35-2	N	No	ND	5.00E-04	mg/l	ND	0 / 4	2.00E-07	TCEQ Benchmark (2017)	ND
Aroclor 1016	12674-11-2	N	Yes	ND	1.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1221	11104-28-2	N	Yes	ND	5.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1232	11141-16-5	N	Yes	ND	5.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1242	53469-21-9	N	Yes	ND	5.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1248	12672-29-6	N	Yes	ND	5.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1254	11097-69-1	N	Yes	ND	5.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Aroclor 1260	11096-82-5	N	Yes	ND	1.00E-04	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
Total PCBs	TPCB	N	Yes	ND	NA	mg/l	ND	0 / 4	3.00E-05	TCEQ Benchmark (2017)	ND
1,1,1,2-Tetrachloroethane	630-20-6	N	No	ND	3.00E-04	mg/l	ND	0 / 4	NA	NA	ND
1,1,1-Trichloroethane	71-55-6	N	No	ND	2.00E-04	mg/l	ND	0 / 4	7.10	TCEQ Benchmark (2017)	ND
1,1,2,2-Tetrachloroethane	79-34-5	N	No	ND	5.00E-04	mg/l	ND	0 / 4	0.451	TCEQ Benchmark (2017)	ND
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	N	No	ND	1.00E-03	mg/l	ND	0 / 4	NA	NA	ND
1,1,2-Trichloroethane	79-00-5	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.275	TCEQ Benchmark (2017)	ND
1,1-Dichloroethane	75-34-3	N	No	ND	2.00E-04	mg/l	ND	0 / 4	NA	NA	ND
1,1-Dichloroethene	75-35-4	N	No	ND	2.00E-04	mg/l	ND	0 / 4	25	TCEQ Benchmark (2017)	ND
1,2,4-Trichlorobenzene	120-82-1	N	No	ND	5.00E-04	mg/l	ND	0 / 4	0.0225	TCEQ Benchmark (2017)	ND
1,2,4-Trimethylbenzene	95-63-6	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.217	TCEQ Benchmark (2017)	ND
1,2-Dibromoethane	106-93-4	N	No	ND	2.00E-04	mg/l	ND	0 / 4	NA	NA	ND
1,2-Dichlorobenzene	95-50-1	N	No	ND	5.00E-04	mg/l	ND	0 / 4	0.099	TCEQ Benchmark (2017)	ND
1,2-Dichloroethane	107-06-2	N	No	ND	2.00E-04	mg/l	ND	0 / 4	11.5	TCEQ Benchmark (2017)	ND
1,2-Dichloropropane	78-87-5	N	No	ND	5.00E-04	mg/l	ND	0 / 4	6.1	TCEQ Benchmark (2017)	ND
1,3,5-Trimethylbenzene	108-67-8	N	No	ND	3.00E-04	mg/l	ND	0 / 4	1.09	Surrogate - Benzene	ND

Table 10
Summary of Detected and Non Detected Constituents for Groundwater Discharging to North Segment of the East Ditch
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count
1,3-Dichlorobenzene	541-73-1	N	No	ND	4.00E-04	mg/l	ND	0 / 4	0.142	TCEQ Benchmark (2017)	ND
1,4-Dichlorobenzene	106-46-7	N	No	ND	4.00E-04	mg/l	ND	0 / 4	0.099	TCEQ Benchmark (2017)	ND
2-Butanone	78-93-3	N	No	ND	5.00E-04	mg/l	ND	0 / 4	NA	NA	ND
2-Hexanone	591-78-6	N	No	ND	1.00E-03	mg/l	ND	0 / 4	NA	NA	ND
4-Methyl-2-pentanone	108-10-1	N	No	ND	7.00E-04	mg/l	ND	0 / 4	61.5	TCEQ Benchmark (2017)	ND
Acetone	67-64-1	N	No	ND	2.00E-03	mg/l	ND	0 / 4	282	TCEQ Benchmark (2017)	ND
Benzene	71-43-2	N	No	3.50E-04 J	2.00E-04	mg/l	MWGW15-022614	1 / 4	1.09	TCEQ Benchmark (2017)	0
Bromodichloromethane	75-27-4	N	No	ND	2.00E-04	mg/l	ND	0 / 4	6.4	NOAA SQuiRT Chronic Value	ND
Bromoform	75-25-2	N	No	ND	4.00E-04	mg/l	ND	0 / 4	1.22	TCEQ Benchmark (2017)	ND
Bromomethane	74-83-9	N	No	ND	4.00E-04	mg/l	ND	0 / 4	0.60	TCEQ Benchmark (2017)	ND
Carbon disulfide	75-15-0	N	No	ND	6.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Carbon tetrachloride	56-23-5	N	No	ND	5.00E-04	mg/l	ND	0 / 4	5.00	TCEQ Benchmark (2017)	ND
Chlorobenzene	108-90-7	N	No	ND	3.00E-04	mg/l	ND	0 / 4	1.00	TCEQ Benchmark (2017)	ND
Chloroethane	75-00-3	N	No	ND	3.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Chloroform	67-66-3	N	No	ND	2.00E-04	mg/l	ND	0 / 4	2.8	TCEQ Benchmark (2017)	ND
Chloromethane	74-87-3	N	No	ND	2.00E-04	mg/l	ND	0 / 4	13.5	TCEQ Benchmark (2017)	ND
cis-1,2-Dichloroethene	156-59-2	N	No	ND	2.00E-04	mg/l	ND	0 / 4	1.12	TCEQ Benchmark (2017)	ND
cis-1,3-Dichloropropene	10061-01-5	N	No	ND	1.00E-04	mg/l	ND	0 / 4	0.04	TCEQ Benchmark (2017)	ND
Cyclohexane	110-82-7	N	No	ND	3.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Dibromochloromethane	124-48-1	N	No	ND	3.00E-04	mg/l	ND	0 / 4	6.4	NOAA SQuiRT Chronic Value	ND
Dichlorodifluoromethane	75-71-8	N	No	ND	3.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Ethylbenzene	100-41-4	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.52	TCEQ Benchmark (2017)	ND
Isopropylbenzene	98-82-8	N	No	4.50E-04 J	3.00E-04	mg/l	MWGW15-022614	1 / 4	1.09	Surrogate - Benzene	0
Methyl acetate	79-20-9	N	No	ND	1.00E-03	mg/l	ND	0 / 4	NA	NA	ND
Methyl tert-butyl ether	1634-04-4	N	No	ND	2.00E-04	mg/l	ND	0 / 4	18	TCEQ Benchmark (2017)	ND
Methylcyclohexane	108-87-2	N	No	ND	3.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Methylene chloride	75-09-2	N	No	ND	4.00E-04	mg/l	ND	0 / 4	10.85	TCEQ Benchmark (2017)	ND
Naphthalene	91-20-3	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.125	TCEQ Benchmark (2017)	ND
n-Butylbenzene	104-51-8	N	No	ND	4.00E-04	mg/l	ND	0 / 4	1.09	Surrogate - Benzene	ND
n-Propylbenzene	103-65-1	N	No	ND	3.00E-04	mg/l	ND	0 / 4	1.09	Surrogate - Benzene	ND
sec-Butylbenzene	135-98-8	N	No	ND	3.00E-04	mg/l	ND	0 / 4	1.09	Surrogate - Benzene	ND
Styrene	100-42-5	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.455	TCEQ Benchmark (2017)	ND
tert-Butylbenzene	98-06-6	N	No	4.00E-04	3.00E-04	mg/l	MWGW15-022614	2 / 4	1.09	Surrogate - Benzene	0
Tetrachloroethene	127-18-4	N	No	ND	3.00E-04	mg/l	ND	0 / 4	0.50	TCEQ Benchmark (2017)	ND
Toluene	108-88-3	N	No	ND	2.00E-04	mg/l	ND	0 / 4	1.30	TCEQ Benchmark (2017)	ND
trans-1,2-Dichloroethene	156-60-5	N	No	ND	2.00E-04	mg/l	ND	0 / 4	1.12	TCEQ Benchmark (2017)	ND
trans-1,3-Dichloropropene	10061-02-6	N	No	ND	2.00E-04	mg/l	ND	0 / 4	0.04	TCEQ Benchmark (2017)	ND
Trichloroethene	79-01-6	N	No	ND	2.00E-04	mg/l	ND	0 / 4	1.60	TCEQ Benchmark (2017)	ND
Trichlorofluoromethane	75-69-4	N	No	ND	3.00E-04	mg/l	ND	0 / 4	6.4	NOAA SQuiRT Chronic Value	ND
Vinyl chloride	75-01-4	N	No	ND	2.00E-04	mg/l	ND	0 / 4	NA	NA	ND
Xylenes, Total	1330-20-7	N	No	ND	5.00E-04	mg/l	ND	0 / 4	0.85	TCEQ Benchmark (2017)	ND
1,1'-Biphenyl	92-52-4	N	No	ND	3.20E-05	mg/l	ND	0 / 4	NA	NA	ND
1-Methylnaphthalene	90-12-0	N	No	ND	3.00E-05	mg/l	ND	0 / 4	NA	NA	ND
2,4,5-Trichlorophenol	95-95-4	N	No	1.90E-04 J	4.00E-05	mg/l	MWGW15-022614	1 / 4	0.012	TCEQ Benchmark (2017)	0
2,4,6-Trichlorophenol	88-06-2	N	No	1.00E-03	6.00E-05	mg/l	MWGW15-022614	1 / 4	0.061	TCEQ Benchmark (2017)	0
2,4-Dichlorophenol	120-83-2	N	No	2.90E-04	6.50E-05	mg/l	MWGW15-022614	1 / 4	2.75	Surrogate - Phenol	0
2,4-Dimethylphenol	105-67-9	N	No	6.10E-04	3.30E-05	mg/l	MWGW15-022614	1 / 4	2.75	Surrogate - Phenol	0
2,4-Dinitrophenol	51-28-5	N	No	ND	5.00E-05	mg/l	ND	0 / 4	0.67	TCEQ Benchmark (2017)	ND
2,4-Dinitrotoluene	121-14-2	N	No	ND	3.00E-05	mg/l	ND	0 / 4	8.6	TCEQ Benchmark (2017)	ND
2,6-Dinitrotoluene	606-20-2	N	No	ND	5.00E-05	mg/l	ND	0 / 4	NA	NA	ND
2-Chloronaphthalene	91-58-7	N	No	ND	4.00E-05	mg/l	ND	0 / 4	0.0075	NOAA SQuiRT Acute Value	ND
2-Chlorophenol	95-57-8	N	No	ND	4.00E-05	mg/l	ND	0 / 4	0.265	TCEQ Benchmark (2017)	ND
2-Methylnaphthalene	91-57-6	N	No	ND	3.40E-05	mg/l	ND	0 / 4	0.03	TCEQ Benchmark (2017)	ND
2-Methylphenol	95-48-7	N	No	1.90E-04 J	3.30E-05	mg/l	MWGW15-022614	1 / 4	0.51	TCEQ Benchmark (2017)	0
2-Nitroaniline	88-74-4	N	No	ND	3.80E-05	mg/l	ND	0 / 4	NA	NA	ND
2-Nitrophenol	88-75-5	N	No	ND	2.40E-05	mg/l	ND	0 / 4	1.47	TCEQ Benchmark (2017)	ND
3&4-Methylphenol	106-44-5	N	No	6.70E-04	3.00E-05	mg/l	MWGW15-022614	1 / 4	0.51	TCEQ In House WQ Chronic Value	0
3,3'-Dichlorobenzidine	91-94-1	N	No	ND	2.40E-05	mg/l	ND	0 / 4	0.037	TCEQ Benchmark (2017)	ND
3-Nitroaniline	99-09-2	N	No	ND	5.60E-05	mg/l	ND	0 / 4	NA	NA	ND
4,6-Dinitro-2-methylphenol	534-52-1	N	No	ND	7.30E-05	mg/l	ND	0 / 4	NA	NA	ND

Table 10
Summary of Detected and Non Detected Constituents for Groundwater Discharging to North Segment of the East Ditch
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count
4-Bromophenyl phenyl ether	101-55-3	N	No	ND	4.70E-05	mg/l	ND	0 / 4	NA	NA	ND
4-Chloro-3-methylphenol	59-50-7	N	No	ND	2.20E-05	mg/l	ND	0 / 4	NA	NA	ND
4-Chloroaniline	106-47-8	N	No	ND	2.10E-05	mg/l	ND	0 / 4	0.129	NOAA SQuiRT Chronic Value	ND
4-Chlorophenyl phenyl ether	7005-72-3	N	No	ND	4.30E-05	mg/l	ND	0 / 4	NA	NA	ND
4-Nitroaniline	100-01-6	N	No	ND	4.00E-05	mg/l	ND	0 / 4	NA	NA	ND
4-Nitrophenol	100-02-7	N	No	ND	6.00E-05	mg/l	ND	0 / 4	0.359	TCEQ Benchmark (2017)	ND
Acenaphthene	83-32-9	N	No	ND	3.00E-05	mg/l	ND	0 / 4	0.0404	TCEQ Benchmark (2017)	ND
Acenaphthylene	208-96-8	N	No	ND	2.10E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Acetophenone	98-86-2	N	No	8.50E-03	NA	mg/l	MWGW15-022614	4 / 4	2.90	Surrogate - Dimethyl phthalate	0
Anthracene	120-12-7	N	No	ND	2.00E-05	mg/l	ND	0 / 4	0.00018	TCEQ Benchmark (2017)	ND
Benz(a)anthracene	56-55-3	N	No	ND	2.50E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Benzaldehyde	100-52-7	N	No	2.10E-04	4.60E-05	mg/l	MWGW15-022614	1 / 4	1.09	Surrogate - Benzene	0
Benzo(a)pyrene	50-32-8	N	No	ND	3.00E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Benzo(b)fluoranthene	205-99-2	N	No	ND	2.80E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Benzo(g,h,i)perylene	191-24-2	N	No	ND	2.60E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Benzo(k)fluoranthene	207-08-9	N	No	ND	2.80E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	2.20E-05	mg/l	ND	0 / 4	6.4	NOAA SQuiRT Chronic Value	ND
Bis(2-chloroethyl)ether	111-44-4	N	No	ND	2.90E-05	mg/l	ND	0 / 4	NA	NA	ND
Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	6.40E-05	mg/l	ND	0 / 4	NA	NA	ND
Bis(2-ethylhexyl)phthalate	117-81-7	N	No	1.60E-04	3.30E-05	mg/l	MWGW15-022614 MWGW16-022614	2 / 4	0.10	TCEQ Benchmark (2017)	0
Butyl benzyl phthalate	85-68-7	N	No	ND	2.10E-05	mg/l	ND	0 / 4	0.147	TCEQ Benchmark (2017)	ND
Caprolactam	105-60-2	N	No	ND	5.90E-05	mg/l	ND	0 / 4	NA	NA	ND
Carbazole	86-74-8	N	No	ND	2.50E-05	mg/l	ND	0 / 4	NA	NA	ND
Chrysene	218-01-9	N	No	ND	4.60E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Dibenz(a,h)anthracene	53-70-3	N	No	ND	2.60E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Dibenzofuran	132-64-9	N	No	ND	2.50E-05	mg/l	ND	0 / 4	0.065	TCEQ Benchmark (2017)	ND
Diethyl phthalate	84-66-2	N	No	ND	2.10E-05	mg/l	ND	0 / 4	0.442	TCEQ Benchmark (2017)	ND
Dimethyl phthalate	131-11-3	N	No	ND	3.00E-05	mg/l	ND	0 / 4	2.90	TCEQ Benchmark (2017)	ND
Di-n-butyl phthalate	84-74-2	N	No	ND	3.00E-05	mg/l	ND	0 / 4	0.005	TCEQ Benchmark (2017)	ND
Di-n-octyl phthalate	117-84-0	N	No	ND	2.30E-05	mg/l	ND	0 / 4	0.0034	NOAA SQuiRT Chronic Value	ND
Fluoranthene	206-44-0	N	No	ND	2.00E-05	mg/l	ND	0 / 4	0.00296	TCEQ Benchmark (2017)	ND
Fluorene	86-73-7	N	No	ND	2.10E-05	mg/l	ND	0 / 4	0.05	TCEQ Benchmark (2017)	ND
Hexachlorobenzene	118-74-1	N	Yes	ND	7.00E-05	mg/l	ND	0 / 4	0.129	NOAA SQuiRT Chronic Value	ND
Hexachlorobutadiene	87-68-3	N	No	ND	5.00E-05	mg/l	ND	0 / 4	0.00032	TCEQ Benchmark (2017)	ND
Hexachlorocyclopentadiene	77-47-4	N	No	ND	5.40E-05	mg/l	ND	0 / 4	0.0037	TCEQ Benchmark (2017)	ND
Hexachloroethane	67-72-1	N	No	ND	3.40E-05	mg/l	ND	0 / 4	0.099	TCEQ Benchmark (2017)	ND
Indeno(1,2,3-cd)pyrene	193-39-5	N	No	ND	5.10E-05	mg/l	ND	0 / 4	0.30	NOAA SQuiRT Acute Value	ND
Isophorone	78-59-1	N	No	ND	3.00E-05	mg/l	ND	0 / 4	0.65	TCEQ Benchmark (2017)	ND
Naphthalene	91-20-3	N	No	1.60E-04 J	5.00E-05	mg/l	MWGW15-022614	1 / 4	0.125	TCEQ Benchmark (2017)	0
Nitrobenzene	98-95-3	N	No	ND	5.00E-05	mg/l	ND	0 / 4	1.40	TCEQ Benchmark (2017)	ND
N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	4.00E-05	mg/l	ND	0 / 4	0.12	TCEQ Benchmark (2017)	ND
N-Nitrosodiphenylamine	86-30-6	N	No	ND	2.90E-05	mg/l	ND	0 / 4	165	TCEQ Benchmark (2017)	ND
Pentachlorophenol	87-86-5	N	No	ND	4.60E-05	mg/l	ND	0 / 4	0.0096	TCEQ Benchmark (2017)	ND
Phenanthrene	85-01-8	N	No	ND	2.00E-05	mg/l	ND	0 / 4	0.0046	TCEQ Benchmark (2017)	ND
Phenol	108-95-2	N	No	1.50E-04 J	3.20E-05	mg/l	MWGW15-022614	1 / 4	2.75	TCEQ Benchmark (2017)	0
Pyrene	129-00-0	N	No	1.40E-04 J	2.20E-05	mg/l	MWGW15-022614	2 / 4	0.00024	TCEQ Benchmark (2017)	0
Total PAHs	TPAH	N	No	3.00E-04	2.79E-04	mg/l	MWGW15-022614	2 / 4	0.30	NOAA SQuiRT Acute Value	0
Cyanide	57-12-5	T	No	ND	0.005	mg/l	ND	0 / 4	0.0056	TCEQ Benchmark (2017)	ND

ND - Not Detected

NA - Not Applicable

WQ - Water Quality

RBEL - Risk Based Exposure Limit

Table 11
Summary of Detected and Non-Detected Constituents for the Background Soils
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Site-Specific 95% Upper Prediction Limit (mg/kg)	TCEQ State Background (mg/kg)
SW6020	Aluminum	7429-90-5	No	11400	NA	mg/kg	BGSS12-010-120321	13 / 13	NA	None available	NA	11,400	30,000
SW6020	Antimony	7440-36-0	No	ND	0.22	mg/kg	ND	ND	5	ORNL Plants	ND	ND	1
SW6020	Arsenic	7440-38-2	No	2.28	NA	mg/kg	BGSS01-010-120321	13 / 13	18	Eco SSL Plants	0	2.122	5.9
SW6020	Barium	7440-39-3	No	51.7	NA	mg/kg	BGSS11-000-120321	13 / 13	330	Eco SSL Earthworms	0	51.7	300
SW6020	Beryllium	7440-41-7	No	0.55	NA	mg/kg	BGSS12-010-120321	13 / 13	10	ORNL Plants	0	0.553	1.5
SW6020	Cadmium	7440-43-9	Yes	1.44	0.05	mg/kg	BGSS06-000-120321	11 / 13	32	Eco SSL Plants	0	1.42	1
SW6020	Chromium	7440-47-3	Yes	6.04	NA	mg/kg	BGSS12-010-120321	13 / 13	0.4	ORNL Earthworms	13	6.002	30
SW6020	Cobalt	7440-48-4	No	3.19	NA	mg/kg	BGSS12-010-120321	13 / 13	13	Eco SSL Plants	0	2.67	7
SW6020	Copper	7440-50-8	Yes	5.92	NA	mg/kg	BGSS11-000-120321	13 / 13	70	Eco SSL Plants	0	5.452	15
SW6020	Lead	7439-92-1	Yes	18.3	NA	mg/kg	BGSS06-000-120321	13 / 13	120	Eco SSL Plants	0	17.3	15
SW6020	Manganese	7439-96-5	No	116	NA	mg/kg	BGSS06-000-120321	13 / 13	220	Eco SSL Plants	0	97.18	300
SW6020	Nickel	7440-02-0	Yes	4.31	NA	mg/kg	BGSS12-010-120321	13 / 13	38	Eco SSL Plants	0	4.31	10
SW6020	Selenium	7782-49-2	Yes	0.89	NA	mg/kg	BGSS01-010-120321	13 / 13	0.52	Eco SSL Plants	7	0.89	0.3
SW6020	Silver	7440-22-4	Yes	0.083	0.086	mg/kg	BGSS11-000-120321	2 / 13	560	Eco SSL Plants	0	ND	1
SW6020	Thallium	7440-28-0	No	0.12	0.076	mg/kg	BGSS04-010-120321	5 / 13	1.0	ORNL Plants	0	0.111	NA
SW6020	Vanadium	7440-62-2	No	11.2	NA	mg/kg	BGSS01-010-120321	13 / 13	2.0	ORNL Plants	13	11.2	50
SW6020	Zinc	7440-66-6	Yes	102.0	NA	mg/kg	BGSS11-000-120321	13 / 13	120	Eco SSL Earthworms	0	102	30
SW7471	Mercury	7439-97-6	Yes	0.0445	NA	mg/kg	BGSS03-000-120321	13 / 13	0.10	ORNL Earthworms	0	0.0445	0.04
SW8081	4,4'-DDD	72-54-8	Yes	0.0019	0.00059	mg/kg	BGSS05-010-120321	1 / 13	0.758	EPA Region V Mammals	0	NA	NA
SW8081	4,4'-DDE	72-55-9	Yes	0.0090	0.00059	mg/kg	BGSS10-000-120321	2 / 13	0.596	EPA Region V Mammals	0	NA	NA
SW8081	4,4'-DDT	50-29-3	Yes	0.0042	0.00059	mg/kg	BGSS05-010-120321	1 / 13	0.021	Eco SSL Mammals	0	NA	NA
SW8081	Aldrin	309-00-2	Yes	ND	0.00035	mg/kg	ND	ND	0.00332	EPA Region V Plants	ND	NA	NA
SW8081	alpha-BHC	319-84-6	Yes	ND	0.00035	mg/kg	ND	ND	0.0994	EPA Region V Plants	ND	NA	NA
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.00023	mg/kg	ND	ND	0.224	ORNL Plants	ND	NA	NA
SW8081	beta-BHC	319-85-7	Yes	ND	0.00035	mg/kg	ND	ND	0.00398	EPA Region V Plants	ND	NA	NA
SW8081	delta-BHC	319-86-8	Yes	ND	0.00023	mg/kg	ND	ND	9.94	EPA Region V Mammals	ND	NA	NA
SW8081	Dieldrin	60-57-1	Yes	ND	0.00059	mg/kg	ND	ND	0.0049	Eco SSL Mammals	ND	NA	NA
SW8081	Endosulfan I	959-98-8	No	ND	0.00035	mg/kg	ND	ND	0.119	EPA Region V Mammals	ND	NA	NA
SW8081	Endosulfan II	33213-65-9	No	ND	0.0007	mg/kg	ND	ND	0.119	EPA Region V Mammals	ND	NA	NA
SW8081	Endosulfan sulfate	1031-07-8	No	ND	0.0007	mg/kg	ND	ND	0.0358	EPA Region V Mammals	ND	NA	NA
SW8081	Endrin	72-20-8	Yes	ND	0.0007	mg/kg	ND	ND	0.0101	EPA Region V Mammals	ND	NA	NA
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.0007	mg/kg	ND	ND	0.0105	EPA Region V Mammals	ND	NA	NA
SW8081	gamma-BHC	58-89-9	Yes	ND	0.00023	mg/kg	ND	ND	0.005	EPA Region V Plants	ND	NA	NA
SW8081	gamma-Chlordane	5103-74-2	Yes	ND	0.00023	mg/kg	ND	ND	0.224	EPA Region V Plants	ND	NA	NA
SW8081	Heptachlor	76-44-8	Yes	0.0017	0.00035	mg/kg	BGSS10-000-120321	1 / 13	0.00598	EPA Region V Mammals	0	NA	NA
SW8081	Heptachlor epoxide	1024-57-3	Yes	0.0013	0.00035	mg/kg	BGSS05-010-120321	1 / 13	0.152	EPA Region V Mammals	0	NA	NA
SW8081	Methoxychlor	72-43-5	No	ND	0.004	mg/kg	ND	ND	0.0199	EPA Region V Mammals	ND	NA	NA
SW8081	Toxaphene	8001-35-2	Yes	ND	0.0056	mg/kg	ND	ND	0.119	EPA Region V Mammals	ND	NA	NA
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.0028	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.0028	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.0028	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.0028	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.0028	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Aroclor 1254	11097-69-1	Yes	0.047	0.0028	mg/kg	BGSS05-010-120321	1 / 13	NA	Evaluate as Total PCBs	NA	NA	NA
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.0021	mg/kg	ND	ND	NA	Evaluate as Total PCBs	ND	NA	NA
SW8082	Total PCBs	TPCB	Yes	0.047	NA	mg/kg	BGSS05-010-120321	1 / 13	40	ORNL Plants	0	NA	NA
SW8270	1,1'-Biphenyl	92-52-4	No	ND	0.0019	mg/kg	ND	ND	60	ORNL Plants	ND	NA	NA
SW8270	1-Methylnaphthalene	90-12-0	No	ND	0.0019	mg/kg	ND	ND	3.24	Surrogate - 2-Methylnaphthalene	ND	NA	NA
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.0019	mg/kg	ND	ND	4.0	ORNL Plants	ND	NA	NA
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.0019	mg/kg	ND	ND	10	ORNL Earthworms	ND	NA	NA
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.0019	mg/kg	ND	ND	87.5	EPA Region V Mammals	ND	NA	NA

Table 11
Summary of Detected and Non-Detected Constituents for the Background Soils
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Site-Specific 95% Upper Prediction Limit (mg/kg)	TCEQ State Background (mg/kg)
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.0019	mg/kg	ND	ND	0.010	EPA Region V Plants	ND	NA	NA
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.0039	mg/kg	ND	ND	20	ORNL Plants	ND	NA	NA
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.0019	mg/kg	ND	ND	6.0	TCEQ Benchmark	ND	NA	NA
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.0019	mg/kg	ND	ND	5.0	TCEQ Benchmark	ND	NA	NA
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.0019	mg/kg	ND	ND	0.0122	EPA Region V Mammals	ND	NA	NA
SW8270	2-Chlorophenol	95-57-8	No	ND	0.0019	mg/kg	ND	ND	0.243	EPA Region V Mammals	ND	NA	NA
SW8270	2-Methylnaphthalene-L	91-57-6	No	0.0018	0.0019	mg/kg	BGSS06-000-120321	1 / 13	3.24	EPA Region V Mammals	0	NA	NA
SW8270	2-Methylphenol	95-48-7	No	ND	0.0019	mg/kg	ND	ND	40.4	EPA Region V Mammals	ND	NA	NA
SW8270	2-Nitroaniline	88-74-4	No	ND	0.0019	mg/kg	ND	ND	74.1	EPA Region V Mammals	ND	NA	NA
SW8270	2-Nitrophenol	88-75-5	No	ND	0.0019	mg/kg	ND	ND	1.6	EPA Region V Mammals	ND	NA	NA
SW8270	3&4-Methylphenol	106-44-5	No	ND	0.0019	mg/kg	ND	ND	3.49	EPA Region V Mammals	ND	NA	NA
SW8270	3,3'-Dichlorobenzidine	91-94-1	No	ND	0.0019	mg/kg	ND	ND	0.646	EPA Region V Mammals	ND	NA	NA
SW8270	3-Nitroaniline	99-09-2	No	ND	0.0019	mg/kg	ND	ND	3.16	EPA Region V Mammals	ND	NA	NA
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	No	ND	0.0019	mg/kg	ND	ND	0.144	EPA Region V Mammals	ND	NA	NA
SW8270	4-Bromophenyl phenyl ether	101-55-3	No	ND	0.0019	mg/kg	ND	ND	NA	NA	ND	NA	NA
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.0019	mg/kg	ND	ND	7.95	EPA Region V Mammals	ND	NA	NA
SW8270	4-Chloroaniline	106-47-8	No	ND	0.0019	mg/kg	ND	ND	1.1	EPA Region V Mammals	ND	NA	NA
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.0019	mg/kg	ND	ND	NA	NA	ND	NA	NA
SW8270	4-Nitroaniline	100-01-6	No	ND	0.0019	mg/kg	ND	ND	21.9	EPA Region V Mammals	ND	NA	NA
SW8270	4-Nitrophenol	100-02-7	No	ND	0.0039	mg/kg	ND	ND	7.0	ORNL Earthworms	ND	NA	NA
SW8270	Acenaphthene - L	83-32-9	No	ND	0.0019	mg/kg	ND	ND	20	ORNL Plants	ND	NA	NA
SW8270	Acenaphthylene - L	208-96-8	No	ND	0.0019	mg/kg	ND	ND	682	EPA Region V Mammals	ND	NA	NA
SW8270	Acetophenone	98-86-2	No	ND	0.0019	mg/kg	ND	ND	300	EPA Region V Mammals	ND	NA	NA
SW8270	Anthracene-L	120-12-7	No	ND	0.0019	mg/kg	ND	ND	1480	EPA Region V Mammals	ND	NA	NA
SW8270	Benz(a)anthracene-H	56-55-3	No	0.0086	0.0019	mg/kg	BGSS06-000-120321	8 / 13	5.21	EPA Region V Mammals	0	NA	NA
SW8270	Benzaldehyde	100-52-7	No	ND	0.0019	mg/kg	ND	ND	0.255	Surrogate - Benzene	ND	NA	NA
SW8270	Benzo(a)pyrene-H	50-32-8	No	0.012	0.0019	mg/kg	BGSS06-000-120321	8 / 13	1.52	EPA Region V Mammals	0	NA	NA
SW8270	Benzo(b)fluoranthene	205-99-2	No	0.014	0.0019	mg/kg	BGSS11-000-120321	8 / 13	59.8	EPA Region V Mammals	0	NA	NA
SW8270	Benzo(g,h,i)perylene	191-24-2	No	0.012	0.0020	mg/kg	BGSS06-000-120321	8 / 13	119	EPA Region V Mammals	0	NA	NA
SW8270	Benzo(k)fluoranthene	207-08-9	No	0.0055	0.0019	mg/kg	BGSS06-000-120321	8 / 13	148	EPA Region V Mammals	0	NA	NA
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	0.0097	0.0019	mg/kg	BGSS11-000-120321	8 / 13	0.302	EPA Region V Mammals	0	NA	NA
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.0019	mg/kg	ND	ND	23.7	EPA Region V Mammals	ND	NA	NA
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.0019	mg/kg	ND	ND	19.9	EPA Region V Mammals	ND	NA	NA
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.0097	0.0019	mg/kg	BGSS11-000-120321	7 / 13	0.925	EPA Region V Mammals	0	NA	NA
SW8270	Butyl benzyl phthalate	85-68-7	No	0.0043	0.0031	mg/kg	BGSS03-000-120321	1 / 13	0.239	EPA Region V Mammals	0	NA	NA
SW8270	Caprolactam	105-60-2	No	ND	0.0023	mg/kg	ND	ND	0.255	Surrogate - Benzene	ND	NA	NA
SW8270	Carbazole	86-74-8	No	ND	0.0019	mg/kg	ND	ND	0.0994	Surrogate - Naphthalene	ND	NA	NA
SW8270	Chrysene-H	218-01-9	No	0.012	0.0019	mg/kg	BGSS11-000-120321	8 / 13	4.73	EPA Region V Mammals	0	NA	NA
SW8270	Dibenz(a,h)anthracene-H	53-70-3	No	0.0039	0.0023	mg/kg	BGSS06-000-120321	3 / 13	18.4	EPA Region V Mammals	0	NA	NA
SW8270	Dibenzofuran	132-64-9	No	ND	0.0019	mg/kg	ND	ND	NA	NA	ND	NA	NA
SW8270	Diethyl phthalate	84-66-2	No	ND	0.0019	mg/kg	ND	ND	100	ORNL Plants	ND	NA	NA
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.0023	mg/kg	ND	ND	200	ORNL Earthworms	ND	NA	NA
SW8270	Di-n-butyl phthalate	84-74-2	No	0.024	0.0023	mg/kg	BGSS06-000-120321	4 / 13	200	ORNL Plants	0	NA	NA
SW8270	Di-n-octyl phthalate	117-84-0	No	ND	0.0023	mg/kg	ND	ND	709	EPA Region V Mammals	ND	NA	NA
SW8270	Fluoranthene-H	206-44-0	No	0.015	0.0019	mg/kg	BGSS06-000-120321	8 / 13	122	EPA Region V Mammals	0	NA	NA
SW8270	Fluorene-L	86-73-7	No	ND	0.0019	mg/kg	ND	ND	30	ORNL Earthworms	ND	NA	NA
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.0019	mg/kg	ND	ND	0.199	EPA Region V Mammals	ND	NA	NA
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.0019	mg/kg	ND	ND	0.0398	EPA Region V Mammals	ND	NA	NA
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.0019	mg/kg	ND	ND	10	ORNL Plants	ND	NA	NA
SW8270	Hexachloroethane	67-72-1	No	ND	0.0019	mg/kg	ND	ND	0.596	EPA Region V Mammals	ND	NA	NA
SW8270	High Molecular Weight PAHs	HPAH	No	0.104	NA	mg/kg	BGSS06-000-120321	8 / 13	1.1	Eco SSL Mammals	0	NA	NA
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	No	0.0095	0.0019	mg/kg	BGSS11-000-120321	8 / 13	109	EPA Region V Mammals	0	NA	NA

Table 11
Summary of Detected and Non-Detected Constituents for the Background Soils
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Soil Ecological Criteria	Reference	Exceedance Count	Site-Specific 95% Upper Prediction Limit (mg/kg)	TCEQ State Background (mg/kg)
SW8270	Isophorone	78-59-1	No	ND	0.0019	mg/kg	ND	139	EPA Region V Mammals	ND	NA	NA	NA
SW8270	Low Molecular Weight PAHs	LPAH	No	0.0072	NA	mg/kg	BGSS06-000-120321	3 / 13	29	Eco SSL Earthworms	0	NA	NA
SW8270	Naphthalene-L	91-20-3	No	ND	0.0019	mg/kg	ND	ND	0.0994	EPA Region V Mammals	ND	NA	NA
SW8270	Nitrobenzene	98-95-3	No	ND	0.0019	mg/kg	ND	ND	40	ORNL Earthworms	ND	NA	NA
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.0023	mg/kg	ND	ND	0.544	EPA Region V Mammals	ND	NA	NA
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.0023	mg/kg	ND	ND	20	ORNL Earthworms	ND	NA	NA
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.0021	mg/kg	ND	ND	5.0	Eco SSL Plants	ND	NA	NA
SW8270	Phenanthrene-L	85-01-8	No	0.0054	0.0029	mg/kg	BGSS06-000-120321	5 / 13	45.7	EPA Region V Mammals	0	NA	NA
SW8270	Phenol	108-95-2	No	ND	0.0023	mg/kg	ND	ND	30	ORNL Earthworms	ND	NA	NA
SW8270	Pyrene-H	129-00-0	No	0.014	0.0019	mg/kg	BGSS06-000-120321	8 / 13	78.5	EPA Region V Mammals	0	NA	NA
SW9014	Cyanide	57-12-5	No	1.56E+00	0.71	mg/kg	BGSS10-000-120321	1 / 13	1.33	EPA Region V Mammals	0	NA	NA

L - denotes Low Molecular Weight PAH

H - denotes High Molecular Weight PAH

PAH - Polycyclic Aromatic Hydrocarbon

PCB - Polychlorinated Biphenyl

J - Estimated Value

JL - Estimated Value, Biased Low

ORNL - Oak Ridge National Laboratory

EPA - Environmental Protection Agency

SSL - Soil Screening Levels

ND - Not Detected

NA - Not Applicable

Table 12
Summary of Detected and Non-detected Constituents for East Ditch Surface Water (Upstream/Background)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count
SW6020	Aluminum	7429-90-5	D	No	0.404	0.0037	mg/l	EDBSW04-111510	5 / 5	0.087	TCEQ Benchmark (2017)	5
SW6020	Antimony	7440-36-0	T	No	0.00112 J	0.0005	mg/l	EDBSW02FD-100610	3 / 5	2.20	TCEQ Benchmark (2017)	0
SW6020	Arsenic	7440-38-2	T	No	0.0247	0.0009	mg/l	EDBSW02FD-100610	5 / 5	0.15	TCEQ Benchmark (2017)	0
SW6020	Barium	7440-39-3	T	No	0.253	0.0007	mg/l	EDBSW04-111510	5 / 5	16	TCEQ Benchmark (2017)	0
SW6020	Beryllium	7440-41-7	T	No	ND	0.0003	mg/l	ND	0 / 5	0.0053	TCEQ Benchmark (2017)	ND
SW6020	Cadmium	7440-43-9	D	No	ND	0.0006	mg/l	ND	0 / 5	0.000341	Texas RBEL hardness specific	ND
SW6020	Chromium	7440-47-3	D	No	ND	0.0006	mg/l	ND	0 / 5	0.109	Texas RBEL hardness specific	ND
SW6020	Cobalt	7440-48-4	T	No	0.00286 J	0.0005	mg/l	EDBSW03-100610	4 / 5	1.5	TCEQ Benchmark (2017)	0
SW6020	Copper	7440-50-8	D	No	0.00315 J	0.0012	mg/l	EDBSW04-111510	1 / 5	0.0141	Texas RBEL hardness specific	0
SW6020	Lead	7439-92-1	D	No	0.00131 J	0.0004	mg/l	EDBSW04-111510	5 / 5	0.00418	Texas RBEL hardness specific	0
SW6020	Manganese	7439-96-5	T	No	0.332	0.0008	mg/l	EDBSW01-100510	5 / 5	1.93	Texas RBEL hardness specific	0
SW6020	Nickel	7440-02-0	D	No	0.00472 J	0.0014	mg/l	EDBSW02FD-100610	5 / 5	0.0774	Texas RBEL hardness specific	0
SW6020	Selenium	7782-49-2	T	Yes	ND	0.0025	mg/l	ND	0 / 5	0.005	TCEQ Benchmark (2017)	ND
SW6020	Silver	7440-22-4	D	No	ND	0.0007	mg/l	ND	0 / 5	0.0001	TCEQ Benchmark (2017)	ND
SW6020	Thallium	7440-28-0	T	Yes	0.000825 J	0.0008	mg/l	EDBSW02-100610	1 / 5	0.18	TCEQ Benchmark (2017)	0
SW6020	Vanadium	7440-62-2	T	No	0.0107	0.0007	mg/l	EDBSW02FD-100610	5 / 5	0.02	TCEQ Benchmark (2017)	0
SW6020	Zinc	7440-66-6	D	No	0.00652	0.00328	mg/l	EDBSW04-111510	2 / 5	0.176	Texas RBEL hardness specific	0
SW7470	Mercury	7439-97-6	T	Yes	ND	0.000042	mg/l	ND	0 / 5	0.0013	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDD	72-54-8	N	Yes	0.000013 J	0.000025	mg/l	EDBSW01-100510	1 / 5	1.10E-05	TCEQ Benchmark (2017)	1
SW8081	4,4'-DDE	72-55-9	N	Yes	0.0000028 J	0.000025	mg/l	EDBSW01-100510	1 / 5	1.10E-04	TCEQ Benchmark (2017)	0
SW8081	4,4'-DDT	50-29-3	N	Yes	0.000054 J	0.000025	mg/l	EDBSW02FD-100610	2 / 5	1.00E-06	TCEQ Benchmark (2017)	2
SW8081	Aldrin	309-00-2	N	No	ND	0.000012	mg/l	ND	0 / 5	0.0003	TCEQ Benchmark (2017)	ND
SW8081	alpha-BHC	319-84-6	N	No	ND	0.000012	mg/l	ND	0 / 5	0.074	TCEQ Benchmark (2017)	ND
SW8081	alpha-Chlordane	5103-71-9	N	No	0.000036	0.000025	mg/l	EDBSW02FD-100610	2 / 5	4.0E-06	TCEQ Benchmark (2017)	2
SW8081	beta-BHC	319-85-7	N	No	0.000011	0.000012	mg/l	EDBSW01-100510	1 / 5	0.083	TCEQ Benchmark (2017)	0
SW8081	delta-BHC	319-86-8	N	No	0.0000083 JL	0.000012	mg/l	EDBSW01-100510	2 / 5	0.141	TCEQ Benchmark (2017)	0
SW8081	Dieldrin	60-57-1	N	No	0.0000085 J	0.000025	mg/l	EDBSW01-100510	2 / 5	2.00E-06	TCEQ Benchmark (2017)	2
SW8081	Endosulfan I	959-98-8	N	No	0.0000037 J	0.000012	mg/l	EDBSW01-100510	1 / 5	5.60E-05	TCEQ Benchmark (2017)	0
SW8081	Endosulfan II	33213-65-9	N	No	ND	0.000025	mg/l	ND	0 / 5	5.60E-05	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan sulfate	1031-07-8	N	No	0.0000044 J	0.000025	mg/l	EDBSW01-100510	1 / 5	5.60E-05	TCEQ Benchmark (2017)	0
SW8081	Endrin	72-20-8	N	No	0.0000096 J	0.000025	mg/l	EDBSW03-100610	1 / 5	2.00E-06	TCEQ Benchmark (2017)	1
SW8081	Endrin aldehyde	7421-93-4	N	No	0.00001 J	0.000025	mg/l	EDBSW01-100510	1 / 5	NA	NA	NA
SW8081	gamma-BHC	58-89-9	N	No	0.0000077	0.000012	mg/l	EDBSW01-100510	2 / 5	8.00E-05	TCEQ Benchmark (2017)	0
SW8081	gamma-Chlordane	5103-74-2	N	No	0.000007 J	0.000025	mg/l	EDBSW01-100510	3 / 5	4.00E-06	TCEQ Benchmark (2017)	3
SW8081	Heptachlor	76-44-8	N	No	0.0000018 JL	0.000012	mg/l	EDBSW04-111510	1 / 5	4.00E-06	TCEQ Benchmark (2017)	0
SW8081	Heptachlor epoxide	1024-57-3	N	No	0.000025	0.000012	mg/l	EDBSW01-100510	2 / 5	3.80E-06	TCEQ Benchmark (2017)	2
SW8081	Methoxychlor	72-43-5	N	No	ND	0.00012	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8081	Toxaphene	8001-35-2	N	No	ND	0.00025	mg/l	ND	0 / 5	2.00E-07	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1016	12674-11-2	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1221	11104-28-2	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1232	11141-16-5	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1242	53469-21-9	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1248	12672-29-6	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1254	11097-69-1	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1260	11096-82-5	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8082	Total PCBs	TPCB	N	Yes	ND	0.0002	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	N	No	ND	0.0002	mg/l	ND	0 / 5	NA	NA	ND
SW8260	1,1,1-Trichloroethane	71-55-6	N	No	ND	0.0001	mg/l	ND	0 / 5	4.91	TCEQ Benchmark (2017)	ND
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	N	No	ND	0.0002	mg/l	ND	0 / 5	0.465	TCEQ Benchmark (2017)	ND
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.207	TCEQ Benchmark (2017)	ND
SW8260	1,1,2-Trichloroethane	79-00-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.90	TCEQ Benchmark (2017)	ND
SW8260	1,1-Dichloroethane	75-34-3	N	No	ND	0.0002	mg/l	ND	0 / 5	0.21	TCEQ Benchmark (2017)	ND
SW8260	1,1-Dichloroethene	75-35-4	N	No	ND	0.0002	mg/l	ND	0 / 5	3.03	TCEQ Benchmark (2017)	ND
SW8260	1,2,4-Trichlorobenzene	120-82-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.0515	TCEQ Benchmark (2017)	ND
SW8260	1,2,4-Trimethylbenzene	95-63-6	N	No	ND	0.0001	mg/l	ND	0 / 5	0.077	TCEQ Benchmark (2017)	ND
SW8260	1,2-Dibromoethane	106-93-4	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8260	1,2-Dichlorobenzene	95-50-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND
SW8260	1,2-Dichloroethane	107-06-2	N	No	ND							

Table 12
Summary of Detected and Non-detected Constituents for East Ditch Surface Water (Upstream/Background)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count
SW8260	1,3-Dichlorobenzene	541-73-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.085	TCEQ Benchmark (2017)	ND
SW8260	1,4-Dichlorobenzene	106-46-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND
SW8260	2-Butanone	78-93-3	N	No	ND	0.0004	mg/l	ND	0 / 5	42.4	TCEQ Benchmark (2017)	ND
SW8260	2-Hexanone	591-78-6	N	No	ND	0.0002	mg/l	ND	0 / 5	6.13	TCEQ Benchmark (2017)	ND
SW8260	4-Methyl-2-pentanone	108-10-1	N	No	ND	0.0002	mg/l	ND	0 / 5	26.40	TCEQ Benchmark (2017)	ND
SW8260	Acetone	67-64-1	N	No	0.0071	0.001	mg/l	EDBSW03-100610	4 / 5	101.2	TCEQ Benchmark (2017)	0
SW8260	Benzene	71-43-2	N	No	ND	0.0001	mg/l	ND	0 / 5	0.13	TCEQ Benchmark (2017)	ND
SW8260	Bromodichloromethane	75-27-4	N	No	ND	0.0002	mg/l	ND	0 / 5	2.16	TCEQ Benchmark (2017)	ND
SW8260	Bromoform	75-25-2	N	No	ND	0.0003	mg/l	ND	0 / 5	0.149	TCEQ Benchmark (2017)	ND
SW8260	Bromomethane	74-83-9	N	No	ND	0.0003	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND
SW8260	Carbon disulfide	75-15-0	N	No	ND	0.0002	mg/l	ND	0 / 5	0.105	TCEQ Benchmark (2017)	ND
SW8260	Carbon tetrachloride	56-23-5	N	No	ND	0.0002	mg/l	ND	0 / 5	0.0098	TCEQ Benchmark (2017)	ND
SW8260	Chlorobenzene	108-90-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND
SW8260	Chloroethane	75-00-3	N	No	ND	0.0003	mg/l	ND	0 / 5	NA	NA	ND
SW8260	Chloroform	67-66-3	N	No	ND	0.0001	mg/l	ND	0 / 5	1.79	TCEQ Benchmark (2017)	ND
SW8260	Chloromethane	74-87-3	N	No	ND	0.0002	mg/l	ND	0 / 5	28	TCEQ Benchmark (2017)	ND
SW8260	cis-1,2-Dichloroethene	156-59-2	N	No	ND	0.0002	mg/l	ND	0 / 5	14	TCEQ Benchmark (2017)	ND
SW8260	cis-1,3-Dichloropropene	10061-01-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.205	TCEQ Benchmark (2017)	ND
SW8260	Cyclohexane	110-82-7	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8260	Dibromochloromethane	124-48-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.129	TCEQ Benchmark (2017)	ND
SW8260	Dichlorodifluoromethane	75-71-8	N	No	ND	0.0002	mg/l	ND	0 / 5	1.963	TCEQ Benchmark (2017)	ND
SW8260	Ethylbenzene	100-41-4	N	No	ND	0.0002	mg/l	ND	0 / 5	1.00	TCEQ Benchmark (2017)	ND
SW8260	Isopropylbenzene	98-82-8	N	No	ND	0.0001	mg/l	ND	0 / 5	0.255	TCEQ Benchmark (2017)	ND
SW8260	Methyl acetate	79-20-9	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8260	Methyl tert-butyl ether	1634-04-4	N	No	ND	0.0001	mg/l	ND	0 / 5	51	TCEQ Benchmark (2017)	ND
SW8260	Methylcyclohexane	108-87-2	N	No	ND	0.0002	mg/l	ND	0 / 5	NA	NA	ND
SW8260	Methylene chloride	75-09-2	N	No	ND	0.0002	mg/l	ND	0 / 5	22	TCEQ Benchmark (2017)	ND
SW8260	Naphthalene	91-20-3	N	No	ND	0.0001	mg/l	ND	0 / 5	0.25	TCEQ Benchmark (2017)	ND
SW8260	n-Butylbenzene	104-51-8	N	No	ND	0.0001	mg/l	ND	0 / 5	0.036	TCEQ Benchmark (2017)	ND
SW8260	n-Propylbenzene	103-65-1	N	No	ND	0.0001	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND
SW8260	sec-Butylbenzene	135-98-8	N	No	ND	0.0001	mg/l	ND	0 / 5	0.041	TCEQ Benchmark (2017)	ND
SW8260	Styrene	100-42-5	N	No	ND	0.0001	mg/l	ND	0 / 5	1.25	TCEQ Benchmark (2017)	ND
SW8260	tert-Butylbenzene	98-06-6	N	No	ND	0.0001	mg/l	ND	0 / 5	0.048	TCEQ Benchmark (2017)	ND
SW8260	Tetrachloroethene	127-18-4	N	No	ND	0.0003	mg/l	ND	0 / 5	1.28	TCEQ Benchmark (2017)	ND
SW8260	Toluene	108-88-3	N	No	ND	0.0001	mg/l	ND	0 / 5	3.40	TCEQ Benchmark (2017)	ND
SW8260	trans-1,2-Dichloroethene	156-60-5	N	No	ND	0.0003	mg/l	ND	0 / 5	22	TCEQ Benchmark (2017)	ND
SW8260	trans-1,3-Dichloropropene	10061-02-6	N	No	ND	0.0001	mg/l	ND	0 / 5	0.205	TCEQ Benchmark (2017)	ND
SW8260	Trichloroethene	79-01-6	N	No	ND	0.0001	mg/l	ND	0 / 5	3.00	TCEQ Benchmark (2017)	ND
SW8260	Trichlorofluoromethane	75-69-4	N	No	ND	0.0002	mg/l	ND	0 / 5	0.871	TCEQ Benchmark (2017)	ND
SW8260	Vinyl chloride	75-01-4	N	No	ND	0.0004	mg/l	ND	0 / 5	2.82	TCEQ Benchmark (2017)	ND
SW8260	Xylenes, Total	1330-20-7	N	No	ND	0.0003	mg/l	ND	0 / 5	1.34	TCEQ Benchmark (2017)	ND
SW8270	1,1'-Biphenyl	92-52-4	N	No	ND	0.0001	mg/l	ND	0 / 5	0.014	TCEQ Benchmark (2017)	ND
SW8270	1-Methylnaphthalene	90-12-0	N	No	ND	0.00009	mg/l	ND	0 / 5	0.0021	TCEQ Benchmark (2017)	ND
SW8270	2,4,5-Trichlorophenol	95-95-4	N	No	ND	0.00009	mg/l	ND	0 / 5	0.064	TCEQ Benchmark (2017)	ND
SW8270	2,4,6-Trichlorophenol	88-06-2	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0135	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dichlorophenol	120-83-2	N	No	ND	0.00008	mg/l	ND	0 / 5	0.085	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dimethylphenol	105-67-9	N	No	ND	0.00008	mg/l	ND	0 / 5	0.105	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dinitrophenol	51-28-5	N	No	ND	0.00008	mg/l	ND	0 / 5	0.031	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dinitrotoluene	121-14-2	N	No	ND	0.00009	mg/l	ND	0 / 5	1.22	TCEQ Benchmark (2017)	ND
SW8270	2,6-Dinitrotoluene	606-20-2	N	No	ND	0.00007	mg/l	ND	0 / 5	NA	NA	ND
SW8270	2-Chloronaphthalene	91-58-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.054	TCEQ Benchmark (2017)	ND
SW8270	2-Chlorophenol	95-57-8	N	No	ND	0.00008	mg/l	ND	0 / 5	0.13	TCEQ Benchmark (2017)	ND
SW8270	2-Methylnaphthalene	91-57-6	N	No	ND	0.00007	mg/l	ND	0 / 5	0.063	TCEQ Benchmark (2017)	ND
SW8270	2-Methylphenol	95-48-7	N	No	ND	0.00008	mg/l	ND	0 / 5	0.56	TCEQ Benchmark (2017)	ND
SW8270	2-Nitroaniline	88-74-4	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8270	2-Nitrophenol	88-75-5	N	No	ND	0.00007	mg/l	ND	0 / 5	0.959	TCEQ Benchmark (2017)	ND
SW8270	3&4-Methylphenol	106-44-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.272	TCEQ Benchmark (2017)	ND
SW8270	3,3'-Dichlorobenzidine	91-94-1	N	No	ND	0.00007	mg/l	ND	0 / 5	0.053	TCEQ Benchmark (2017)	ND
SW8270	3-Nitroaniline	99-09-2	N	No	ND	0.00008	mg/l	ND	0 / 5	NA	NA	ND
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	N	No	ND	0.00008	mg/l	ND	0 / 5	0.012	TCEQ Benchmark (2017)	ND

Table 12
Summary of Detected and Non-detected Constituents for East Ditch Surface Water (Upstream/Background)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Freshwater Chronic Criteria	Reference	Exceedance Count
SW8270	4-Bromophenyl phenyl ether	101-55-3	N	No	ND	0.00009	mg/l	ND	0 / 5	0.0015	TCEQ Benchmark (2017)	ND
SW8270	4-Chloro-3-methylphenol	59-50-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.1	TCEQ Benchmark (2017)	ND
SW8270	4-Chloroaniline	106-47-8	N	No	ND	0.00007	mg/l	ND	0 / 5	0.05	NOAA SQuiRT Chronic Value	ND
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	N	No	ND	0.00008	mg/l	ND	0 / 5	NA	NA	ND
SW8270	4-Nitroaniline	100-01-6	N	No	ND	0.00007	mg/l	ND	0 / 5	NA	NA	ND
SW8270	4-Nitrophenol	100-02-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.532	TCEQ Benchmark (2017)	ND
SW8270	Acenaphthene	83-32-9	N	No	ND	0.00009	mg/l	ND	0 / 5	0.023	TCEQ Benchmark (2017)	ND
SW8270	Acenaphthylene	208-96-8	N	No	ND	0.00007	mg/l	ND	0 / 5	4.84	NOAA SQuiRT Chronic Value	ND
SW8270	Acetophenone	98-86-2	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Anthracene	120-12-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0003	TCEQ Benchmark (2017)	ND
SW8270	Benz(a)anthracene	56-55-3	N	No	ND	0.00007	mg/l	ND	0 / 5	0.0346	TCEQ Benchmark (2017)	ND
SW8270	Benzaldehyde	100-52-7	N	No	ND	0.00012	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Benzo(a)pyrene	50-32-8	N	No	ND	0.00008	mg/l	ND	0 / 5	1.40E-05	TCEQ Benchmark (2017)	ND
SW8270	Benzo(b)fluoranthene	205-99-2	N	No	ND	0.00009	mg/l	ND	0 / 5	0.00907	NOAA SQuiRT Chronic Value	ND
SW8270	Benzo(g,h,i)perylene	191-24-2	N	No	ND	0.00009	mg/l	ND	0 / 5	0.00764	NOAA SQuiRT Chronic Value	ND
SW8270	Benzo(k)fluoranthene	207-08-9	N	No	ND	0.0001	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	0.00009	mg/l	ND	0 / 5	11	NOAA SQuiRT Acute Value	ND
SW8270	Bis(2-chloroethyl)ether	111-44-4	N	No	ND	0.00007	mg/l	ND	0 / 5	12	TCEQ Benchmark (2017)	ND
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	0.00007	mg/l	ND	0 / 5	6.308	TCEQ Benchmark (2017)	ND
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	N	No	ND	0.0014	mg/l	ND	0 / 5	0.02	TCEQ Benchmark (2017)	ND
SW8270	Butyl benzyl phthalate	85-68-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.093	TCEQ Benchmark (2017)	ND
SW8270	Caprolactam	105-60-2	N	No	ND	0.00008	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Carbazole	86-74-8	N	No	ND	0.00007	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Chrysene	218-01-9	N	No	ND	0.00007	mg/l	ND	0 / 5	0.007	TCEQ Benchmark (2017)	ND
SW8270	Dibenz(a,h)anthracene	53-70-3	N	No	ND	0.00008	mg/l	ND	0 / 5	0.005	TCEQ Benchmark (2017)	ND
SW8270	Dibenzofuran	132-64-9	N	No	ND	0.00008	mg/l	ND	0 / 5	0.094	TCEQ Benchmark (2017)	ND
SW8270	Diethyl phthalate	84-66-2	N	No	ND	0.00007	mg/l	ND	0 / 5	1.043	TCEQ Benchmark (2017)	ND
SW8270	Dimethyl phthalate	131-11-3	N	No	ND	0.0001	mg/l	ND	0 / 5	1.65	TCEQ Benchmark (2017)	ND
SW8270	Di-n-butyl phthalate	84-74-2	N	No	ND	0.00007	mg/l	ND	0 / 5	0.007	TCEQ Benchmark (2017)	ND
SW8270	Di-n-octyl phthalate	117-84-0	N	No	ND	0.00009	mg/l	ND	0 / 5	0.022	TCEQ Benchmark (2017)	ND
SW8270	Fluoranthene	206-44-0	N	No	ND	0.00007	mg/l	ND	0 / 5	0.00616	TCEQ Benchmark (2017)	ND
SW8270	Fluorene	86-73-7	N	No	ND	0.00007	mg/l	ND	0 / 5	0.011	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorobenzene	118-74-1	N	Yes	ND	0.0001	mg/l	ND	0 / 5	0.00368	NOAA SQuiRT Chronic Value	ND
SW8270	Hexachlorobutadiene	87-68-3	N	No	ND	0.00015	mg/l	ND	0 / 5	0.00436	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorocyclopentadiene	77-47-4	N	No	ND	0.00008	mg/l	ND	0 / 5	0.00001	TCEQ Benchmark (2017)	ND
SW8270	Hexachloroethane	67-72-1	N	No	ND	0.00017	mg/l	ND	0 / 5	0.012	TCEQ Benchmark (2017)	ND
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	N	No	ND	0.0001	mg/l	ND	0 / 5	0.00431	NOAA SQuiRT Chronic Value	ND
SW8270	Isophorone	78-59-1	N	No	ND	0.00007	mg/l	ND	0 / 5	6	TCEQ Benchmark (2017)	ND
SW8270	Naphthalene	91-20-3	N	No	ND	0.0001	mg/l	ND	0 / 5	0.25	TCEQ Benchmark (2017)	ND
SW8270	Nitrobenzene	98-95-3	N	No	ND	0.00009	mg/l	ND	0 / 5	1.1	TCEQ Benchmark (2017)	ND
SW8270	N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	0.0001	mg/l	ND	0 / 5	0.02	TCEQ Benchmark (2017)	ND
SW8270	N-Nitrosodiphenylamine	86-30-6	N	No	ND	0.00009	mg/l	ND	0 / 5	0.29	TCEQ Benchmark (2017)	ND
SW8270	Pentachlorophenol	87-86-5	N	No	ND	0.00008	mg/l	ND	0 / 5	0.00245	TCEQ Benchmark (2017)	ND
SW8270	Phenanthrene	85-01-8	N	No	ND	0.00007	mg/l	ND	0 / 5	0.03	TCEQ Benchmark (2017)	ND
SW8270	Phenol	108-95-2	N	No	ND	0.00007	mg/l	ND	0 / 5	0.11	TCEQ Benchmark (2017)	ND
SW8270	Pyrene	129-00-0	N	No	ND	0.00007	mg/l	ND	0 / 5	0.007	TCEQ Benchmark (2017)	ND
SW8270	Total PAHs	TPAH	N	No	ND	0.000725	mg/l	ND	0 / 5	NA	NA	ND
SW9014	Cyanide	57-12-5	T	No	0.029	0.004	mg/l	EDBSW02-100610	1 / 5	0.0107	TCEQ Benchmark (2017)	1

Samples taken from this segment of the ditch used to represent upstream/background in the SLERA.

J - Estimated Value

ND - Not Detected

JL - Estimated Value, Biased Low

NA - Not Applicable

T - Total Metals

WQ - Water Quality

D - Dissolved Metals

RBEL - Risk Based Exposure Limit

N - Total/Dissolved not applicable

Table 13
Summary of Detected and Non-detected Constituents for East Ditch Sediment (Upstream/Background)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count
SW6020	Aluminum	7429-90-5	No	16300	29	mg/kg	EDBSS01-000-100510	13 / 13	25500	NOAA SQuiRT	0
SW6020	Antimony	7440-36-0	No	ND	0.36	mg/kg	ND	0 / 13	0.3	TCEQ Benchmark (2017)	ND
SW6020	Arsenic	7440-38-2	No	4.15	0.086	mg/kg	EDBSS02-000-100510	13 / 13	9.79	TCEQ Benchmark (2017)	0
SW6020	Barium	7440-39-3	No	465	11	mg/kg	EDBSD08-000-111510	13 / 13	NA	NA	NA
SW6020	Beryllium	7440-41-7	No	0.912	0.072	mg/kg	EDBSS01-000-100510	13 / 13	NA	NA	NA
SW6020	Cadmium	7440-43-9	Yes	0.449 J	0.057	mg/kg	EDBSS02-000-100510	13 / 13	0.99	TCEQ Benchmark (2017)	0
SW6020	Chromium	7440-47-3	No	11.7	0.072	mg/kg	EDBSS01-000-100510	13 / 13	43.4	TCEQ Benchmark (2017)	0
SW6020	Cobalt	7440-48-4	No	8.33	0.043	mg/kg	EDBSS02-000-100510	13 / 13	50	TCEQ Benchmark (2017)	0
SW6020	Copper	7440-50-8	Yes	18.7	0.2	mg/kg	EDBSS02-000-100510	13 / 13	31.6	TCEQ Benchmark (2017)	0
SW6020	Lead	7439-92-1	No	27.7	0.072	mg/kg	EDBSS02-000-100510	13 / 13	35.8	TCEQ Benchmark (2017)	0
SW6020	Manganese	7439-96-5	No	616	9.6	mg/kg	EDBSS02-000-100510	13 / 13	460	TCEQ Benchmark (2017)	1
SW6020	Nickel	7440-02-0	Yes	13.1	0.086	mg/kg	EDBSS02-000-100510	13 / 13	22.7	TCEQ Benchmark (2017)	0
SW6020	Selenium	7782-49-2	Yes	0.68 J	0.36	mg/kg	EDBSD09-000 111510	10 / 13	NA	NA	NA
SW6020	Silver	7440-22-4	No	0.0851 J	0.057	mg/kg	EDBSS01FD-000-100510	5 / 13	0.57	TCEQ Benchmark (2017)	0
SW6020	Thallium	7440-28-0	No	0.433 J	0.1	mg/kg	EDBSS01-000-100510	12 / 13	NA	NA	NA
SW6020	Vanadium	7440-62-2	No	14.8	0.1	mg/kg	EDBSS01-000-100510	13 / 13	NA	NA	NA
SW6020	Zinc	7440-66-6	Yes	72.1	0.36	mg/kg	EDBSS01-000-100510	13 / 13	121	TCEQ Benchmark (2017)	0
SW7471	Mercury	7439-97-6	Yes	0.0635	0.00031	mg/kg	EDBSS02-000-100510	13 / 13	0.18	TCEQ Benchmark (2017)	0
SW8081	4,4'-DDD	72-54-8	Yes	ND	0.00076	mg/kg	ND	0 / 13	0.00488	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.00076	mg/kg	ND	0 / 13	0.00316	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDT	50-29-3	Yes	ND	0.00076	mg/kg	ND	0 / 13	0.00416	TCEQ Benchmark (2017)	ND
SW8081	Aldrin	309-00-2	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.002	TCEQ Benchmark (2017)	ND
SW8081	alpha-BHC	319-84-6	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.006	TCEQ Benchmark (2017)	ND
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.0003	mg/kg	ND	0 / 13	0.00324	TCEQ Benchmark (2017)	ND
SW8081	beta-BHC	319-85-7	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.005	TCEQ Benchmark (2017)	ND
SW8081	delta-BHC	319-86-8	Yes	ND	0.0003	mg/kg	ND	0 / 13	0.13	TCEQ Benchmark (2017)	ND
SW8081	Dieldrin	60-57-1	Yes	ND	0.00076	mg/kg	ND	0 / 13	0.0019	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan I	959-98-8	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.0029	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan II	33213-65-9	Yes	ND	0.00091	mg/kg	ND	0 / 13	0.014	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan sulfate	1031-07-8	Yes	ND	0.00091	mg/kg	ND	0 / 13	NA	NA	ND
SW8081	Endrin	72-20-8	Yes	ND	0.00091	mg/kg	ND	0 / 13	0.00222	TCEQ Benchmark (2017)	ND
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.00091	mg/kg	ND	0 / 13	NA	NA	ND
SW8081	gamma-BHC	58-89-9	Yes	ND	0.0003	mg/kg	ND	0 / 13	0.00237	TCEQ Benchmark (2017)	ND
SW8081	gamma-Chlordane	5103-74-2	Yes	ND	0.0003	mg/kg	ND	0 / 13	0.00324	TCEQ Benchmark (2017)	ND
SW8081	Heptachlor	76-44-8	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.0006	TCEQ Benchmark (2017)	ND
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.00046	mg/kg	ND	0 / 13	0.00247	TCEQ Benchmark (2017)	ND
SW8081	Methoxychlor	72-43-5	Yes	ND	0.0052	mg/kg	ND	0 / 13	0.019	TCEQ Benchmark (2017)	ND
SW8081	Toxaphene	8001-35-2	Yes	ND	0.0058	mg/kg	ND	0 / 13	0.0001	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.0036	mg/kg	ND	0 / 13	0.007	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.0036	mg/kg	ND	0 / 13	NA	NA	ND
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.0036	mg/kg	ND	0 / 13	NA	NA	ND
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.0036	mg/kg	ND	0 / 13	NA	NA	ND
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.0036	mg/kg	ND	0 / 13	0.03	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.0036	mg/kg	ND	0 / 13	0.06	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.0027	mg/kg	ND	0 / 13	0.005	TCEQ Benchmark (2017)	ND
SW8082	Total PCBs	TPCB	Yes	ND	0.01215	mg/kg	ND	0 / 13	0.0598	TCEQ Benchmark (2017)	ND
SW8260	1,1,1,2-Tetrachloroethane	630-20-6	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	1,1,1-Trichloroethane	71-55-6	No	ND	0.00076	mg/kg	ND	0 / 13	8.27	TCEQ Benchmark (2017)	ND
SW8260	1,1,2,2-Tetrachloroethane	79-34-5	No	ND	0.00076	mg/kg	ND	0 / 13	0.63	TCEQ Benchmark (2017)	ND
SW8260	1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	No	ND	0.00076	mg/kg	ND	0 / 13	2.78	TCEQ Benchmark (2017)	ND
SW8260	1,1,2-Trichloroethane	79-00-5	No	ND	0.00076	mg/kg	ND	0 / 13	0.98	TCEQ Benchmark (2017)	ND
SW8260	1,1-Dichloroethane	75-34-3	No	ND	0.00076	mg/kg	ND	0 / 13	2.32	TCEQ Benchmark (2017)	ND
SW8260	1,1-Dichloroethene	75-35-4	No	ND	0.00076	mg/kg	ND	0 / 13	3.74	TCEQ Benchmark (2017)	ND
SW8260	1,2,4-Trichlorobenzene	120-82-1	No	ND	0.00091	mg/kg	ND	0 / 13	0.88	TCEQ Benchmark (2017)	ND
SW8260	1,2,4-Trimethylbenzene	95-63-6	No	ND	0.00076	mg/kg	ND	0 / 13	0.76	TCEQ Benchmark (2017)	ND
SW8260	1,2-Dibromoethane	106-93-4	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	1,2-Dichlorobenzene	95-50-1	No	ND	0.00076	mg/kg	ND	0 / 13	0.83	TCEQ Benchmark (2017)	ND
SW8260	1,2-Dichloroethane	107-06-2	No	ND	0.00076	mg/kg	ND	0 / 13	9.56	TCEQ Benchmark (2017)	ND
SW8260	1,2-Dichloropropane	78-87-5	No	ND	0.00076	mg/kg	ND	0 / 13	7.05	TCEQ Benchmark (2017)	ND
SW8260	1,3,5-Trimethylbenzene	108-67-8	No	ND	0.00076	mg/kg	ND	0 / 13	0.77	TCEQ Benchmark (2017)	ND
SW8260	1,3-Dichlorobenzene	541-73-1	No	ND	0.00076	mg/kg	ND	0 / 13	0.19	TCEQ Benchmark (2017)	ND

Table 13
Summary of Detected and Non-detected Constituents for East Ditch Sediment (Upstream/Background)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count
SW8260	1,4-Dichlorobenzene	106-46-7	No	ND	0.00076	mg/kg	ND	0 / 13	0.77	TCEQ Benchmark (2017)	ND
SW8260	2-Butanone	78-93-3	No	0.0061 J	0.0021	mg/kg	EDBSD08-000-111510	1 / 13	25.71	TCEQ Benchmark (2017)	0
SW8260	2-Hexanone	591-78-6	No	ND	0.0015	mg/kg	ND	0 / 13	4.7	TCEQ Benchmark (2017)	ND
SW8260	4-Methyl-2-pentanone	108-10-1	No	ND	0.0015	mg/kg	ND	0 / 13	19.43	TCEQ Benchmark (2017)	NA
SW8260	Acetone	67-64-1	No	0.027	0.046	mg/kg	EDBSD08-000-111510	2 / 13	60.03	TCEQ Benchmark (2017)	0
SW8260	Benzene	71-43-2	No	ND	0.00076	mg/kg	ND	0 / 13	0.16	TCEQ Benchmark (2017)	ND
SW8260	Bromodichloromethane	75-27-4	No	ND	0.00076	mg/kg	ND	0 / 13	2.46	TCEQ Benchmark (2017)	ND
SW8260	Bromoform	75-25-2	No	ND	0.00076	mg/kg	ND	0 / 13	0.22	TCEQ Benchmark (2017)	ND
SW8260	Bromomethane	74-83-9	No	ND	0.0015	mg/kg	ND	0 / 13	0.08	TCEQ Benchmark (2017)	ND
SW8260	Carbon disulfide	75-15-0	No	ND	0.0015	mg/kg	ND	0 / 13	0.12	TCEQ Benchmark (2017)	ND
SW8260	Carbon tetrachloride	56-23-5	No	ND	0.00076	mg/kg	ND	0 / 13	1.2	TCEQ Benchmark (2017)	ND
SW8260	Chlorobenzene	108-90-7	No	ND	0.00076	mg/kg	ND	0 / 13	0.74	TCEQ Benchmark (2017)	ND
SW8260	Chloroethane	75-00-3	No	ND	0.0015	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	Chloroform	67-66-3	No	ND	0.00076	mg/kg	ND	0 / 13	1.889	TCEQ Benchmark (2017)	ND
SW8260	Chloromethane	74-87-3	No	ND	0.0015	mg/kg	ND	0 / 13	17.8	TCEQ Benchmark (2017)	ND
SW8260	cis-1,2-Dichloroethene	156-59-2	No	ND	0.00076	mg/kg	ND	0 / 13	12.28	TCEQ Benchmark (2017)	ND
SW8260	cis-1,3-Dichloropropene	10061-01-5	No	ND	0.00076	mg/kg	ND	0 / 13	0.23	TCEQ Benchmark (2017)	ND
SW8260	Cyclohexane	110-82-7	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	Dibromochloromethane	124-48-1	No	ND	0.00076	mg/kg	ND	0 / 13	0.16	TCEQ Benchmark (2017)	ND
SW8260	Dichlorodifluoromethane	75-71-8	No	ND	0.00076	mg/kg	ND	0 / 13	3.68	TCEQ Benchmark (2017)	ND
SW8260	Ethylbenzene	100-41-4	No	ND	0.00076	mg/kg	ND	0 / 13	2.63	TCEQ Benchmark (2017)	ND
SW8260	Isopropylbenzene	98-82-8	No	ND	0.00076	mg/kg	ND	0 / 13	8.99	TCEQ Benchmark (2017)	ND
SW8260	Methyl acetate	79-20-9	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	Methyl tert-butyl ether	1634-04-4	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	Methylcyclohexane	108-87-2	No	ND	0.00076	mg/kg	ND	0 / 13	NA	NA	ND
SW8260	Methylene chloride	75-09-2	No	0.002 J	0.0015	mg/kg	EDBSS04-000-100510	8 / 13	15.51	TCEQ Benchmark (2017)	ND
SW8260	Naphthalene	91-20-3	No	ND	0.00076	mg/kg	ND	0 / 13	0.176	TCEQ Benchmark (2017)	ND
SW8260	n-Butylbenzene	104-51-8	No	ND	0.00076	mg/kg	ND	0 / 13	1.09	TCEQ Benchmark (2017)	ND
SW8260	n-Propylbenzene	103-65-1	No	ND	0.00076	mg/kg	ND	0 / 13	0.72	TCEQ Benchmark (2017)	ND
SW8260	sec-Butylbenzene	135-98-8	No	ND	0.00076	mg/kg	ND	0 / 13	0.88	TCEQ Benchmark (2017)	ND
SW8260	Styrene	100-42-5	No	ND	0.00076	mg/kg	ND	0 / 13	10.24	TCEQ Benchmark (2017)	ND
SW8260	tert-Butylbenzene	98-06-6	No	ND	0.00076	mg/kg	ND	0 / 13	1.21	TCEQ Benchmark (2017)	ND
SW8260	Tetrachloroethene	127-18-4	No	ND	0.00091	mg/kg	ND	0 / 13	2.74	TCEQ Benchmark (2017)	ND
SW8260	Toluene	108-88-3	No	0.0077	0.00076	mg/kg	EDBSD08-000-111510	1 / 13	6.76	TCEQ Benchmark (2017)	0
SW8260	trans-1,2-Dichloroethene	156-60-5	No	ND	0.00076	mg/kg	ND	0 / 13	23.95	TCEQ Benchmark (2017)	ND
SW8260	trans-1,3-Dichloropropene	10061-02-6	No	ND	0.00076	mg/kg	ND	0 / 13	0.23	TCEQ Benchmark (2017)	ND
SW8260	Trichloroethene	79-01-6	No	ND	0.00076	mg/kg	ND	0 / 13	4.56	TCEQ Benchmark (2017)	ND
SW8260	Trichlorofluoromethane	75-69-4	No	ND	0.00076	mg/kg	ND	0 / 13	1.69	TCEQ Benchmark (2017)	ND
SW8260	Vinyl chloride	75-01-4	No	ND	0.00076	mg/kg	ND	0 / 13	1.96	TCEQ Benchmark (2017)	ND
SW8260	Xylenes, Total	1330-20-7	No	ND	0.0023	mg/kg	ND	0 / 13	4	TCEQ Benchmark (2017)	ND
SW8270	1,1'-Biphenyl	92-52-4	No	ND	0.0044	mg/kg	ND	0 / 13	1.1	TCEQ Benchmark (2017)	ND
SW8270	1-Methylnaphthalene-T	90-12-0	No	ND	0.0035	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.0043	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.0033	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2,4-Dinitrotoluene	121-14-2	No	ND	0.005	mg/kg	ND	0 / 13	1.34	TCEQ Benchmark (2017)	ND
SW8270	2,6-Dinitrotoluene	606-20-2	No	ND	0.0049	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2-Chloronaphthalene	91-58-7	Yes	ND	0.0062	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2-Chlorophenol	95-57-8	No	ND	0.0049	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2-Methylnaphthalene-L,T	91-57-6	No	ND	0.0041	mg/kg	ND	0 / 13	0.0202	TCEQ Benchmark (2017)	ND
SW8270	2-Methylphenol	95-48-7	No	0.0083 J	0.0044	mg/kg	EDBSS04-000-100510	2 / 13	0.5	NOAA SQuRT	0
SW8270	2-Nitroaniline	88-74-4	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	2-Nitrophenol	88-75-5	No	ND	0.007	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	3&4-Methylphenol	106-44-5	No	0.076	0.0043	mg/kg	EDBSD08-000-111510	4 / 13	0.26	TCEQ Benchmark (2017)	0
SW8270	3,3'-Dichlorobenzidine	91-94-1	No	ND	0.0047	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	3-Nitroaniline	99-09-2	No	ND	0.004	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4-Bromophenyl phenyl ether	101-55-3	Yes	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.005	mg/kg	ND	0 / 13	0.94	TCEQ Benchmark (2017)	ND

Table 13
Summary of Detected and Non-detected Constituents for East Ditch Sediment (Upstream/Background)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Maximum Detection (mg/kg)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Sediment Freshwater Criteria	Reference	Exceedance Count
SW8270	4-Chloroaniline	106-47-8	No	ND	0.0033	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	Yes	ND	0.0033	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4-Nitroaniline	100-01-6	No	ND	0.005	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	4-Nitrophenol	100-02-7	No	ND	0.0058	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Acenaphthene-L,T	83-32-9	Yes	0.026	0.0033	mg/kg	EDBSS02-000-100510	1 / 13	0.00671	TCEQ Benchmark (2017)	1
SW8270	Acenaphthylene-L,T	208-96-8	Yes	ND	0.0033	mg/kg	ND	0 / 13	0.00587	TCEQ Benchmark (2017)	ND
SW8270	Acetophenone	98-86-2	No	ND	0.0037	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Anthracene-L,T	120-12-7	Yes	0.072	0.0033	mg/kg	EDBSS02-000-100510	2 / 13	0.0572	TCEQ Benchmark (2017)	1
SW8270	Benz(a)anthracene-H,T	56-55-3	Yes	0.4	0.0043	mg/kg	EDBSS02-000-100510	5 / 13	0.108	TCEQ Benchmark (2017)	1
SW8270	Benzaldehyde	100-52-7	No	ND	0.007	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Benzo(a)pyrene-H,T	50-32-8	Yes	0.37	0.0035	mg/kg	EDBSS02-000-100510	4 / 13	0.150	TCEQ Benchmark (2017)	1
SW8270	Benzo(b)fluoranthene-T	205-99-2	Yes	0.6	0.046	mg/kg	EDBSS02-000-100510	5 / 13	0.24	Surrogate - Benzo(k)fluoranthene	1
SW8270	Benzo(g,h,i)perylene-T	191-24-2	Yes	0.22	0.0044	mg/kg	EDBSS02-000-100510	4 / 13	0.17	NOAA SQuRT	1
SW8270	Benzo(k)fluoranthene-T	207-08-9	Yes	0.2	0.005	mg/kg	EDBSS02-000-100510	3 / 13	0.24	NOAA SQuRT	0
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.0037	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.0043	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	ND	0.0041	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.021 JL	0.01	mg/kg	EDBSD11-000-111510	2 / 13	0.5	TCEQ Benchmark (2017)	0
SW8270	Butyl benzyl phthalate	85-68-7	Yes	ND	0.0038	mg/kg	ND	0 / 13	11	TCEQ Benchmark (2017)	ND
SW8270	Caprolactam	105-60-2	No	0.014	0.0037	mg/kg	EDBSS01FD-000-100510	2 / 13	0.16	Surrogate - Benzene	0
SW8270	Carbazole	86-74-8	No	0.072	0.0033	mg/kg	EDBSS02-000-100510	2 / 13	0.176	Surrogate - Naphthalene	0
SW8270	Chrysene-H,T	218-01-9	Yes	0.45	0.0044	mg/kg	EDBSS02-000-100510	5 / 13	0.166	TCEQ Benchmark (2017)	1
SW8270	Dibenz(a,h)anthracene-H,T	53-70-3	Yes	0.062	0.0033	mg/kg	EDBSS02-000-100510	1 / 13	0.033	TCEQ Benchmark (2017)	1
SW8270	Dibenzofuran	132-64-9	Yes	0.011	0.0033	mg/kg	EDBSS02-000-100510	1 / 13	0.2	TCEQ Benchmark (2017)	0
SW8270	Diethyl phthalate	84-66-2	No	0.0065 JL	0.005	mg/kg	EDBSD11-000-111510	2 / 13	0.63	TCEQ Benchmark (2017)	0
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.0037	mg/kg	ND	0 / 13	1.49	TCEQ Benchmark (2017)	ND
SW8270	Di-n-butyl phthalate	84-74-2	Yes	0.0071 JL	0.0038	mg/kg	EDBSD09-000 111510	3 / 13	11	TCEQ Benchmark (2017)	0
SW8270	Di-n-octyl phthalate	117-84-0	No	ND	0.0044	mg/kg	ND	0 / 13	0.039	TCEQ Benchmark (2017)	ND
SW8270	Fluoranthene-H,T	206-44-0	Yes	0.84	0.031	mg/kg	EDBSS02-000-100510	8 / 13	0.423	TCEQ Benchmark (2017)	1
SW8270	Fluorene-L,T	86-73-7	Yes	0.02	0.0033	mg/kg	EDBSS02-000-100510	1 / 13	0.0774	TCEQ Benchmark (2017)	0
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.004	mg/kg	ND	0 / 13	0.02	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorobutadiene	87-68-3	Yes	ND	0.0067	mg/kg	ND	0 / 13	0.055	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorocyclopentadiene	77-47-4	Yes	ND	0.0055	mg/kg	ND	0 / 13	0.067	TCEQ Benchmark (2017)	ND
SW8270	Hexachloroethane	67-72-1	Yes	ND	0.0059	mg/kg	ND	0 / 13	0.225	TCEQ Benchmark (2017)	ND
SW8270	High Molecular Weight PAHs	HPAH	Yes	2.732	0.01035	mg/kg	EDBSS02-000-100510	8 / 13	NA	Evaluate as Total PAHs	NA
SW8270	Indeno(1,2,3-cd)pyrene-T	193-39-5	Yes	0.26	0.0053	mg/kg	EDBSS02-000-100510	3 / 13	0.2	NOAA SQuRT	1
SW8270	Isophorone	78-59-1	No	ND	0.0046	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Low Molecular Weight PAHs	LPAH	Yes	0.48815	0.0126	mg/kg	EDBSS02-000-100510	6 / 13	NA	Evaluate as Total PAHs	NA
SW8270	Naphthalene-L,T	91-20-3	No	0.0067 J	0.005	mg/kg	EDBSS02-000-100510	1 / 13	0.176	TCEQ Benchmark (2017)	0
SW8270	Nitrobenzene	98-95-3	No	ND	0.005	mg/kg	ND	0 / 13	2.10	TCEQ Benchmark (2017)	ND
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	ND	0.0061	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.0033	mg/kg	ND	0 / 13	NA	NA	ND
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.0043	mg/kg	ND	0 / 13	1.2	TCEQ Benchmark (2017)	ND
SW8270	Phenanthrene-L,T	85-01-8	Yes	0.36	0.0046	mg/kg	EDBSS02-000-100510	5 / 13	0.204	TCEQ Benchmark (2017)	1
SW8270	Phenol	108-95-2	No	0.0068 J	0.005	mg/kg	EDBSD08-000-111510	1 / 13	0.12	TCEQ Benchmark (2017)	0
SW8270	Pyrene-H,T	129-00-0	Yes	0.61	0.031	mg/kg	EDBSS02-000-100510	8 / 13	0.195	TCEQ Benchmark (2017)	1
SW8270	Total PAHs	TPAH	Yes	4.50175	0.03385	mg/kg	EDBSS02-000-100510	8 / 13	1.61	TCEQ Benchmark (2017)	1
SW9014	Cyanide	57-12-5	No	ND	0.89	mg/kg	ND	0 / 13	NA	NA	ND

Sediment samples taken from this segment of the ditch used to represent upstream/background in the SLERA.

L - Low Molecular Weight PAH

PCB - Polychlorinated Biphenyl

NOAA SQuRT - National Oceanic and Atmospheric Agency Screening Quick Reference Tables

H - High Molecular Weight PAH

ND - Not Detected, NA - Not Applicable

TCEQ - Texas Commission on Environmental Quality

T - Total PAH

J - Estimated Value

PAH - Polycyclic Aromatic Hydrocarbon

JL - Estimated Value, Biased Low

Table 14
Summary of Detected and Non-detected Constituents for Up River Road Surface Water
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count
SW6020	Aluminum	7429-90-5	T	No	0.695	0.004	mg/l	UPSW04-020112	5 / 5	0.75	Geometric Mean; EPA Draft Criteria)	0
SW6020	Antimony	7440-36-0	T	No	0.00205 J	0.0008	mg/l	UPSW04-020112	2 / 5	0.73	TCEQ Benchmark (2017)	0
SW6020	Arsenic	7440-38-2	T	No	0.0198	0.0013	mg/l	UPSW06-000-FD-013112	5 / 5	0.078	TCEQ Benchmark (2017)	0
SW6020	Barium	7440-39-3	T	No	0.182	0.0009	mg/l	UPSW02-020112	5 / 5	25	TCEQ Benchmark (2017)	0
SW6020	Beryllium	7440-41-7	T	No	ND	0.0007	mg/l	ND	0 / 5	0.10	NOAA SQuiRT British Columbia Chronic Value	ND
SW6020	Cadmium	7440-43-9	D	No	ND	0.0008	mg/l	ND	0 / 5	0.00875	TCEQ Benchmark (2017)	ND
SW6020	Chromium	7440-47-3	D	No	0.00176 J	0.0012	mg/l	UPSW02-020112	2 / 5	0.0274	NOAA SQuiRT Australian & New Zealand Chronic	0
SW6020	Cobalt	7440-48-4	T	No	0.0014 J	0.0008	mg/l	UPSW06-000-FD-013112	2 / 5	0.001	NOAA SQuiRT Australian & New Zealand Chronic	2
SW6020	Copper	7440-50-8	D	No	0.0126	0.0015	mg/l	UPSW04-020112	5 / 5	0.0036	TCEQ Benchmark (2017)	3
SW6020	Lead	7439-92-1	D	No	ND	0.0007	mg/l	ND	0 / 5	0.0053	TCEQ Benchmark (2017)	ND
SW6020	Manganese	7439-96-5	T	No	1.37	0.0025	mg/l	UPSW06-000-FD-013112	5 / 5	0.10	NOAA SQuiRT British Columbia Chronic Value	3
SW6020	Nickel	7440-02-0	D	No	0.00692	0.0012	mg/l	UPSW06-013112	5 / 5	0.0131	TCEQ Benchmark (2017)	0
SW6020	Selenium	7782-49-2	T	Yes	0.00125 J	0.001	mg/l	UPSW04-020112	3 / 5	0.136	TCEQ Benchmark (2017)	0
SW6020	Silver	7440-22-4	D	No	ND	0.0008	mg/l	ND	0 / 5	0.00019	TCEQ Benchmark (2017)	ND
SW6020	Thallium	7440-28-0	T	Yes	ND	0.001	mg/l	ND	0 / 5	2.1	TCEQ Benchmark (2017)	ND
SW6020	Vanadium	7440-62-2	T	No	0.0273	0.0009	mg/l	UPSW04-020112	5 / 5	0.050	NOAA SQuiRT British Columbia Chronic Value	0
SW6020	Zinc	7440-66-6	D	No	0.0215	0.00697	mg/l	UPSW02-020112	3 / 5	0.0842	TCEQ Benchmark (2017)	0
SW7470	Mercury	7439-97-6	T	Yes	ND	0.000042	mg/l	ND	0 / 5	0.0011	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDD	72-54-8	N	Yes	0.0000047	0.0000025	mg/l	UPSW04-020112	3 / 5	0.000025	TCEQ Benchmark (2017)	0
SW8081	4,4'-DDE	72-55-9	N	Yes	ND	0.0000025	mg/l	ND	0 / 5	0.0014	NOAA SQuiRT Chronic Value	ND
SW8081	4,4'-DDT	50-29-3	N	Yes	0.0000094 J	0.0000025	mg/l	UPSW02-020112	2 / 5	1.00E-06	TCEQ Benchmark (2017)	2
SW8081	Aldrin	309-00-2	N	No	0.0000025	0.0000012	mg/l	UPSW07-020112	2 / 5	0.00013	TCEQ Benchmark (2017)	0
SW8081	alpha-BHC	319-84-6	N	No	0.0000092 JL	0.0000012	mg/l	UPSW06-000-FD-013112	5 / 5	0.025	TCEQ Benchmark (2017)	0
SW8081	alpha-Chlordane	5103-71-9	N	No	ND	0.0000025	mg/l	ND	0 / 5	4.00E-06	TCEQ Benchmark (2017)	ND
SW8081	beta-BHC	319-85-7	N	No	0.0000074 J	0.0000012	mg/l	UPSW06-000-FD-013112	3 / 5	NA	NA	NA
SW8081	delta-BHC	319-86-8	N	No	0.0000043	0.0000012	mg/l	UPSW04-020112	2 / 5	NA	NA	NA
SW8081	Dieldrin	60-57-1	N	No	ND	0.0000025	mg/l	ND	0 / 5	2.00E-06	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan I	959-98-8	N	No	0.00003 J	0.0000012	mg/l	UPSW07-020112	1 / 5	9.00E-06	TCEQ Benchmark (2017)	1
SW8081	Endosulfan II	33213-65-9	N	No	ND	0.0000025	mg/l	ND	0 / 5	9.00E-06	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan sulfate	1031-07-8	N	No	ND	0.0000025	mg/l	ND	0 / 5	9.00E-06	TCEQ Benchmark (2017)	ND
SW8081	Endrin	72-20-8	N	No	0.0000044	0.0000025	mg/l	UPSW07-020112	2 / 5	2.00E-06	TCEQ Benchmark (2017)	2
SW8081	Endrin aldehyde	7421-93-4	N	No	0.0000027 JL	0.0000025	mg/l	UPSW06-000-FD-013112	1 / 5	NA	NA	NA
SW8081	gamma-BHC	58-89-9	N	No	0.0000078 J	0.0000012	mg/l	UPSW02-020112	1 / 5	1.60E-05	TCEQ Benchmark (2017)	0
SW8081	gamma-Chlordane	5103-74-2	N	No	ND	0.0000025	mg/l	ND	0 / 5	4.00E-06	TCEQ Benchmark (2017)	ND
SW8081	Heptachlor	76-44-8	N	No	0.0000032 JL	0.0000012	mg/l	UPSW06-000-FD-013112	3 / 5	4.00E-06	TCEQ Benchmark (2017)	0
SW8081	Heptachlor epoxide	1024-57-3	N	No	ND	0.0000012	mg/l	ND	0 / 5	3.60E-06	TCEQ Benchmark (2017)	ND
SW8081	Methoxychlor	72-43-5	N	No	ND	0.000012	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8081	Toxaphene	8001-35-2	N	No	ND	0.000025	mg/l	ND	0 / 5	2.00E-07	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1016	12674-11-2	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1221	11104-28-2	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1232	11141-16-5	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1242	53469-21-9	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1248	12672-29-6	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1254	11097-69-1	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1260	11096-82-5	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8082	Total PCBs	TPCB	N	Yes	ND	0.0002	mg/l	ND	0 / 5	3.00E-05	TCEQ Benchmark (2017)	ND
SW8270	1,1'-Biphenyl	92-52-4	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	1-Methylnaphthalene	90-12-0	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	2,4,5-Trichlorophenol	95-95-4	N	No	ND	0.00005	mg/l	ND	0 / 5	0.451	TCEQ Benchmark (2017)	ND
SW8270	2,4,6-Trichlorophenol	88-06-2	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	2,4-Dichlorophenol	120-83-2	N	No	ND	0.00005	mg/l	ND	0 / 5	0.275	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dimethylphenol	105-67-9	N	No	0.00036	0.00005	mg/l	UPSW02-020112	1 / 5	2.75	Surrogate -Phenol	0
SW8270	2,4-Dinitrophenol	51-28-5	N	No	ND	0.00008	mg/l	ND	0 / 5	25	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dinitrotoluene	121-14-2	N	No	ND	0.00005	mg/l	ND	0 / 5	0.0225	TCEQ Benchmark (2017)	ND
SW8270	2,6-Dinitrotoluene	606-20-2	N	No	ND	0.00006	mg/l	ND	0 / 5	0.217	TCEQ Benchmark (2017)	ND
SW8270	2-Chloronaphthalene	91-58-7	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	2-Chlorophenol	95-57-8	N	No	ND	0.00006	mg/l	ND	0 / 5	0.099	TCEQ Benchmark (2017)	ND
SW8270	2-Methylnaphthalene	91-57-6	N	No	ND	0.00005	mg/l	ND	0 / 5	11.5	TCEQ Benchmark (2017)	ND
SW8270</td												

Table 14
Summary of Detected and Non-detected Constituents for Up River Road Surface Water
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COC?	Maximum Detection (mg/L)	Maximum Detection Limit	Units	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Exceedance Count
SW8270	3,3'-Dichlorobenzidine	91-94-1	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	3-Nitroaniline	99-09-2	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	N	No	ND	0.00008	mg/l	ND	0 / 5	61.5	TCEQ Benchmark (2017)	ND
SW8270	4-Bromophenyl phenyl ether	101-55-3	N	No	ND	0.00005	mg/l	ND	0 / 5	282	TCEQ Benchmark (2017)	ND
SW8270	4-Chloro-3-methylphenol	59-50-7	N	No	ND	0.00005	mg/l	ND	0 / 5	1.09	TCEQ Benchmark (2017)	ND
SW8270	4-Chloroaniline	106-47-8	N	No	ND	0.00005	mg/l	ND	0 / 5	6.4	NOAA SQuiRT Chronic Value	ND
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	N	No	ND	0.00005	mg/l	ND	0 / 5	1.22	TCEQ Benchmark (2017)	ND
SW8270	4-Nitroaniline	100-01-6	N	No	ND	0.00005	mg/l	ND	0 / 5	0.60	TCEQ Benchmark (2017)	ND
SW8270	4-Nitrophenol	100-02-7	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Acenaphthene	83-32-9	N	No	ND	0.00005	mg/l	ND	0 / 5	5.00	TCEQ Benchmark (2017)	ND
SW8270	Acenaphthylene	208-96-8	N	No	ND	0.00005	mg/l	ND	0 / 5	1.00	TCEQ Benchmark (2017)	ND
SW8270	Acetophenone	98-86-2	N	No	0.0001 J	0.0001	mg/l	UPSW02-020112	1 / 5	2.90	Surrogate - Dimethyl phthalate	0
SW8270	Anthracene	120-12-7	N	No	ND	0.00005	mg/l	ND	0 / 5	2.8	TCEQ Benchmark (2017)	ND
SW8270	Benz(a)anthracene	56-55-3	N	No	ND	0.00005	mg/l	ND	0 / 5	13.5	TCEQ Benchmark (2017)	ND
SW8270	Benzaldehyde	100-52-7	N	No	ND	0.00005	mg/l	ND	0 / 5	1.12	TCEQ Benchmark (2017)	ND
SW8270	Benzo(a)pyrene	50-32-8	N	No	ND	0.00005	mg/l	ND	0 / 5	0.04	TCEQ Benchmark (2017)	ND
SW8270	Benzo(b)fluoranthene	205-99-2	N	No	ND	0.00006	mg/l	ND	0 / 5	0.30	NOAA SQuiRT Acute Value	ND
SW8270	Benzo(g,h,i)perylene	191-24-2	N	No	ND	0.00005	mg/l	ND	0 / 5	6.4	NOAA SQuiRT Chronic Value	ND
SW8270	Benzo(k)fluoranthene	207-08-9	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Bis(2-chloroethoxy)methane	111-91-1	N	No	ND	0.00005	mg/l	ND	0 / 5	0.52	TCEQ Benchmark (2017)	ND
SW8270	Bis(2-chloroethyl)ether	111-44-4	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	N	No	0.00046	0.0001	mg/l	UPSW06-000-FD-013112	3 / 5	18	TCEQ Benchmark (2017)	0
SW8270	Butyl benzyl phthalate	85-68-7	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Caprolactam	105-60-2	N	No	ND	0.00005	mg/l	ND	0 / 5	10.85	TCEQ Benchmark (2017)	ND
SW8270	Carbazole	86-74-8	N	No	0.000074 J	0.00005	mg/l	UPSW02-020112	1 / 5	0.125	Surrogate - Naphthalene	0
SW8270	Chrysene	218-01-9	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	NA
SW8270	Dibenz(a,h)anthracene	53-70-3	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	NA
SW8270	Dibenzofuran	132-64-9	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	NA
SW8270	Diethyl phthalate	84-66-2	N	No	0.000071 J	0.00005	mg/l	UPSW06-013112	2 / 5	0.455	TCEQ Benchmark (2017)	0
SW8270	Dimethyl phthalate	131-11-3	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	NA
SW8270	Di-n-butyl phthalate	84-74-2	N	No	ND	0.00005	mg/l	ND	0 / 5	0.50	TCEQ Benchmark (2017)	ND
SW8270	Di-n-octyl phthalate	117-84-0	N	No	ND	0.00005	mg/l	ND	0 / 5	1.30	TCEQ Benchmark (2017)	ND
SW8270	Fluoranthene	206-44-0	N	No	ND	0.00005	mg/l	ND	0 / 5	1.12	TCEQ Benchmark (2017)	ND
SW8270	Fluorene	86-73-7	N	No	ND	0.00005	mg/l	ND	0 / 5	0.04	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorobenzene	118-74-1	N	No	ND	0.00006	mg/l	ND	0 / 5	1.60	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorobutadiene	87-68-3	N	No	ND	0.00006	mg/l	ND	0 / 5	6.4	NOAA SQuiRT Chronic Value	ND
SW8270	Hexachlorocyclopentadiene	77-47-4	N	No	ND	0.00006	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Hexachloroethane	67-72-1	N	No	ND	0.00005	mg/l	ND	0 / 5	0.85	TCEQ Benchmark (2017)	ND
SW8270	Indeno(1,2,3-cd)pyrene	193-39-5	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Isophorone	78-59-1	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Naphthalene	91-20-3	N	No	ND	0.00005	mg/l	ND	0 / 5	0.125	TCEQ Benchmark (2017)	ND
SW8270	Nitrobenzene	98-95-3	N	No	ND	0.00005	mg/l	ND	0 / 5	0.061	TCEQ Benchmark (2017)	ND
SW8270	N-Nitrosodi-n-propylamine	621-64-7	N	No	ND	0.00008	mg/l	ND	0 / 5	NA	NA	ND
SW8270	N-Nitrosodiphenylamine	86-30-6	N	No	ND	0.00005	mg/l	ND	0 / 5	NA	NA	ND
SW8270	Pentachlorophenol	87-86-5	N	No	ND	0.00005	mg/l	ND	0 / 5	0.67	TCEQ Benchmark (2017)	ND
SW8270	Phenanthrene	85-01-8	N	No	ND	0.00005	mg/l	ND	0 / 5	8.6	TCEQ Benchmark (2017)	ND
SW8270	Phenol	108-95-2	N	No	0.000065 J	0.00005	mg/l	UPSW07-020112	1 / 5	2.75	TCEQ Benchmark (2017)	0
SW8270	Pyrene	129-00-0	N	No	ND	0.00005	mg/l	ND	0 / 5	0.0075	NOAA SQuiRT Acute Value	ND
SW8270	Total PAHs	TPAH	N	No	ND	0.000455	mg/l	ND	0 / 5	0.265	TCEQ Benchmark (2017)	ND

Samples from Up River Road represent contributions of COPCs to the confluence of the East Ditch and the Up River Road ditch.

J - Estimated Value

ND - Not Detected

JL - Estimated Value, Biased Low

NA - Not Applicable

T - Total Metals

WQ - Water Quality

D - Dissolved Metals

RBEL - Risk Based Exposure Limit

N - Total/Dissolved not applicable

Table 15
Summary of Detected and Non-detected Constituents for Up River Road Sediment
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Max Detection (mg/kg)	Max Detection Limit	Units	Sample with Max Detection	Detections Count	Sediment Marine Criteria	Reference	Exceedance Count
SW6020	Aluminum	7429-90-5	No	10200	46	mg/kg	UPSD03-000-020112	9 / 9	18000	NOAA SQuiRT	0
SW6020	Antimony	7440-36-0	No	0.42 J	0.46	mg/kg	UPSD03-000-020112	1 / 9	2	TCEQ Benchmark (2017)	0
SW6020	Arsenic	7440-38-2	No	24.7	0.23	mg/kg	UPSD06-000-013112	9 / 9	8.2	TCEQ Benchmark (2017)	2
SW6020	Barium	7440-39-3	No	834	19	mg/kg	UPSD06-000-013112	9 / 9	130.1	NOAA SQuiRT	8
SW6020	Beryllium	7440-41-7	No	0.399 J	0.12	mg/kg	UPSD02-000-020112	9 / 9	NA	NA	NA
SW6020	Cadmium	7440-43-9	Yes	0.907 J	0.12	mg/kg	UPSD06-000-013112	9 / 9	1.2	TCEQ Benchmark (2017)	0
SW6020	Chromium	7440-47-3	No	102	0.21	mg/kg	UPSD03-000-020112	9 / 9	81	TCEQ Benchmark (2017)	1
SW6020	Cobalt	7440-48-4	No	12.7	0.16	mg/kg	UPSD03-000-020112	9 / 9	10	NOAA SQuiRT	1
SW6020	Copper	7440-50-8	Yes	34.9	0.23	mg/kg	UPSD06-000-FD-013112	9 / 9	34	TCEQ Benchmark (2017)	1
SW6020	Lead	7439-92-1	No	68	0.12	mg/kg	UPSD06-000-013112	9 / 9	46.7	TCEQ Benchmark (2017)	2
SW6020	Manganese	7439-96-5	No	6540	23	mg/kg	UPSD03-000-020112	9 / 9	260	NOAA SQuiRT	5
SW6020	Nickel	7440-02-0	Yes	26.6	0.21	mg/kg	UPSD03-000-020112	9 / 9	20.9	TCEQ Benchmark (2017)	1
SW6020	Selenium	7782-49-2	Yes	0.95	0.42	mg/kg	UPSD02-000-020112	9 / 9	1.0	NOAA SQuiRT	0
SW6020	Silver	7440-22-4	No	0.237 J	0.19	mg/kg	UPSD06-000-013112	2 / 9	1.0	TCEQ Benchmark (2017)	0
SW6020	Thallium	7440-28-0	No	ND	0.16	mg/kg	ND	0 / 9	NA	NA	ND
SW6020	Vanadium	7440-62-2	No	25.2	0.53	mg/kg	UPSD03-000-020112	9 / 9	57	NOAA SQuiRT	0
SW6020	Zinc	7440-66-6	Yes	162	0.58	mg/kg	UPSD06-000-013112	9 / 9	150	TCEQ Benchmark (2017)	1
SW7471	Mercury	7439-97-6	Yes	0.116	0.00078	mg/kg	UPSD02-000-020112	9 / 9	0.15	TCEQ Benchmark (2017)	0
SW8081	4,4'-DDD	72-54-8	Yes	ND	0.026	mg/kg	ND	0 / 9	0.00122	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDE	72-55-9	Yes	ND	0.026	mg/kg	ND	0 / 9	0.00207	TCEQ Benchmark (2017)	ND
SW8081	4,4'-DDT	50-29-3	Yes	ND	0.026	mg/kg	ND	0 / 9	0.00119	TCEQ Benchmark (2017)	ND
SW8081	Aldrin	309-00-2	Yes	ND	0.016	mg/kg	ND	0 / 9	0.0095	NOAA SQuiRT	ND
SW8081	alpha-BHC	319-84-6	Yes	0.022 JL	0.016	mg/kg	UPSD06-000-FD-013112	1 / 9	NA	NA	NA
SW8081	alpha-Chlordane	5103-71-9	Yes	ND	0.011	mg/kg	ND	0 / 9	0.00226	TCEQ Benchmark (2017)	ND
SW8081	beta-BHC	319-85-7	Yes	ND	0.016	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	delta-BHC	319-86-8	Yes	ND	0.011	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	Dieldrin	60-57-1	Yes	ND	0.026	mg/kg	ND	0 / 9	0.00071	TCEQ Benchmark (2017)	ND
SW8081	Endosulfan I	959-98-8	No	ND	0.016	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	Endosulfan II	33213-65-9	No	ND	0.032	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	Endosulfan sulfate	1031-07-8	No	0.028 JL	0.032	mg/kg	UPSD02-000-020112	1 / 9	NA	NA	NA
SW8081	Endrin	72-20-8	Yes	ND	0.032	mg/kg	ND	0 / 9	0.00267	TCEQ Benchmark (2017)	ND
SW8081	Endrin aldehyde	7421-93-4	Yes	ND	0.032	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	gamma-BHC	58-89-9	Yes	ND	0.011	mg/kg	ND	0 / 9	0.00032	TCEQ Benchmark (2017)	ND
SW8081	gamma-Chlordane	5103-74-2	Yes	ND	0.011	mg/kg	ND	0 / 9	0.00226	TCEQ Benchmark (2017)	ND
SW8081	Heptachlor	76-44-8	Yes	ND	0.016	mg/kg	ND	0 / 9	0.0006	TCEQ Benchmark (2017)	ND
SW8081	Heptachlor epoxide	1024-57-3	Yes	ND	0.016	mg/kg	ND	0 / 9	0.00274	NOAA SQuiRT	ND
SW8081	Methoxychlor	72-43-5	No	ND	0.18	mg/kg	ND	0 / 9	NA	NA	ND
SW8081	Toxaphene	8001-35-2	Yes	ND	0.25	mg/kg	ND	0 / 9	0.0001	NOAA SQuiRT	ND
SW8082	Aroclor 1016	12674-11-2	Yes	ND	0.063	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Aroclor 1221	11104-28-2	Yes	ND	0.063	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Aroclor 1232	11141-16-5	Yes	ND	0.063	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Aroclor 1242	53469-21-9	Yes	ND	0.063	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Aroclor 1248	12672-29-6	Yes	ND	0.063	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Aroclor 1254	11097-69-1	Yes	ND	0.063	mg/kg	ND	0 / 9	0.0633	TCEQ Benchmark (2017)	ND
SW8082	Aroclor 1260	11096-82-5	Yes	ND	0.047	mg/kg	ND	0 / 9	NA	Evaluate as Total PCBs	ND
SW8082	Total PCBs	TPCB	Yes	ND	0.2125	mg/kg	ND	0 / 9	0.0227	TCEQ Benchmark (2017)	ND
SW8270	1,1'-Biphenyl	92-52-4	No	0.13 J	0.048	mg/kg	UPSD02-000-020112	1 / 9	0.073	NOAA SQuiRT	1
SW8270	1-Methylnaphthalene-T	90-12-0	No	0.37	0.048	mg/kg	UPSD02-000-020112	3 / 9	0.07	Surrogate - 2-Methylnaphthalene	1
SW8270	2,4,5-Trichlorophenol	95-95-4	No	ND	0.048	mg/kg	ND	0 / 9	0.003	NOAA SQuiRT	ND
SW8270	2,4,6-Trichlorophenol	88-06-2	No	ND	0.048	mg/kg	ND	0 / 9	0.006	NOAA SQuiRT	ND
SW8270	2,4-Dichlorophenol	120-83-2	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	2,4-Dimethylphenol	105-67-9	No	ND	0.048	mg/kg	ND	0 / 9	0.029	TCEQ Benchmark (2017)	ND
SW8270	2,4-Dinitrophenol	51-28-5	No	ND	0.098	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	2,4-Dinitrotoluene	121-14-2	No	0.02 J	0.048	mg/kg	UPSD07-000-020112	1 / 9	9.46	TCEQ Benchmark (2017)	0
SW8270	2,6-Dinitrotoluene	606-20-2	No	0.025 J	0.048	mg/kg	UPSD07-000-020112	1 / 9	9.46	Surrogate 2,4-Dinitrotoluene	0
SW8270	2-Chloronaphthalene	91-58-7	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	2-Chlorophenol	95-57-8	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	2-Methylnaphthalene-L,T	91-57-6	No	0.65	0.048	mg/kg	UPSD02-000-020112	8 / 9	0.07	TCEQ Benchmark (2017)	2
SW8270	2-Methylphenol	95-48-7	No	ND	0.048	mg/kg	ND	0 / 9	0.063	TCEQ Benchmark (2017)	ND
SW8270	2-Nitroaniline	88-74-4	No	0.065 J	0.048	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	2-Nitrophenol	88-75-5	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	3&4-Methylphenol	106-44-5	No	0.064 J	0.048	mg/kg	UPSD06-000-013112	1 / 9	0.67	TCEQ Benchmark (2017)	0

Table 15
Summary of Detected and Non-detected Constituents for Up River Road Sediment
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Bioaccumulative COC?	Max Detection (mg/kg)	Max Detection Limit	Units	Sample with Max Detection	Detections Count	Sediment Marine Criteria	Reference	Exceedance Count
SW8270	3,3'-Dichlorobenzidine	91-94-1	No	0.023 JL	0.048	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	3-Nitroaniline	99-09-2	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4,6-Dinitro-2-methylphenol	534-52-1	No	0.074 J	0.048	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	4-Bromophenyl phenyl ether	101-55-3	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4-Chloro-3-methylphenol	59-50-7	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4-Chloroaniline	106-47-8	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4-Chlorophenyl phenyl ether	7005-72-3	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4-Nitroaniline	100-01-6	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	4-Nitrophenol	100-02-7	No	0.088 J	0.098	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	Acenaphthene-L,T	83-32-9	No	3.1	0.048	mg/kg	UPSD02-000-020112	2 / 9	0.016	TCEQ Benchmark (2017)	2
SW8270	Acenaphthylene-L,T	208-96-8	No	ND	0.048	mg/kg	ND	0 / 9	0.044	TCEQ Benchmark (2017)	ND
SW8270	Acetophenone	98-86-2	No	0.049 J	0.048	mg/kg	UPSD06-000-013112	2 / 9	0.53	Surrogate - Dimethyl phthalate	0
SW8270	Anthracene-L,T	120-12-7	No	6.1	0.048	mg/kg	UPSD02-000-020112	5 / 9	0.0853	TCEQ Benchmark (2017)	2
SW8270	Benz(a)anthracene-H,T	56-55-3	No	17	0.24	mg/kg	UPSD02-000-020112	9 / 9	0.261	TCEQ Benchmark (2017)	2
SW8270	Benzaldehyde	100-52-7	No	0.054 JL	0.048	mg/kg	UPSD06-000-013112	4 / 9	1.36	Surrogate - Benzene	0
SW8270	Benzo(a)pyrene-H,T	50-32-8	No	15	0.24	mg/kg	UPSD02-000-020112	8 / 9	0.43	TCEQ Benchmark (2017)	3
SW8270	Benzo(b)fluoranthene-T	205-99-2	No	22	0.24	mg/kg	UPSD02-000-020112	8 / 9	1.107	NOAA SQuRT	1
SW8270	Benzo(g,h,i)perylene-T	191-24-2	No	7.8	0.051	mg/kg	UPSD02-000-020112	8 / 9	0.497	NOAA SQuRT	2
SW8270	Benzo(k)fluoranthene-T	207-08-9	No	6.4	0.048	mg/kg	UPSD02-000-020112	8 / 9	0.537	NOAA SQuRT	2
SW8270	Bis(2-chloroethoxy)methane	111-91-1	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	Bis(2-chloroethyl)ether	111-44-4	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	Bis(2-chloroisopropyl)ether	108-60-1	No	0.02 J	0.048	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	Bis(2-ethylhexyl)phthalate	117-81-7	No	0.37	0.048	mg/kg	UPSD06-000-013112	5 / 9	0.182	TCEQ Benchmark (2017)	1
SW8270	Butyl benzyl phthalate	85-68-7	No	0.037 J	0.083	mg/kg	UPSD03-000-020112	1 / 9	0.049	TCEQ Benchmark (2017)	0
SW8270	Caprolactam	105-60-2	No	0.025 J	0.059	mg/kg	UPSD07-000-020112	1 / 9	1.36	Surrogate - Benzene	0
SW8270	Carbazole	86-74-8	No	4.5 JH	0.048	mg/kg	UPSD02-000-020112	3 / 9	0.16	Surrogate -Naphthalene	1
SW8270	Chrysene-H,T	218-01-9	No	19	0.24	mg/kg	UPSD02-000-020112	9 / 9	0.384	TCEQ Benchmark (2017)	2
SW8270	Dibenz(a,h)anthracene-H,T	53-70-3	No	2.3	0.059	mg/kg	UPSD02-000-020112	4 / 9	0.0634	TCEQ Benchmark (2017)	1
SW8270	Dibenzofuran	132-64-9	No	1.6	0.048	mg/kg	UPSD02-000-020112	2 / 9	0.15	TCEQ Benchmark (2017)	1
SW8270	Diethyl phthalate	84-66-2	No	ND	0.048	mg/kg	ND	0 / 9	0.61	TCEQ Benchmark (2017)	ND
SW8270	Dimethyl phthalate	131-11-3	No	ND	0.059	mg/kg	ND	0 / 9	0.53	TCEQ Benchmark (2017)	ND
SW8270	Di-n-butyl phthalate	84-74-2	No	0.021 J	0.059	mg/kg	UPSD05-000-020112	1 / 9	2.2	TCEQ Benchmark (2017)	0
SW8270	Di-n-octyl phthalate	117-84-0	No	0.16	0.059	mg/kg	UPSD07-000-020112	1 / 9	0.58	TCEQ Benchmark (2017)	0
SW8270	Fluoranthene-H,T	206-44-0	No	33	0.24	mg/kg	UPSD02-000-020112	9 / 9	0.6	TCEQ Benchmark (2017)	2
SW8270	Fluorene-L,T	86-73-7	No	2.4	0.048	mg/kg	UPSD02-000-020112	2 / 9	0.019	TCEQ Benchmark (2017)	2
SW8270	Hexachlorobenzene	118-74-1	Yes	ND	0.048	mg/kg	ND	0 / 9	0.006	NOAA SQuRT	ND
SW8270	Hexachlorobutadiene	87-68-3	No	ND	0.048	mg/kg	ND	0 / 9	0.022	TCEQ Benchmark (2017)	ND
SW8270	Hexachlorocyclopentadiene	77-47-4	No	ND	0.048	mg/kg	ND	0 / 9	0.36	TCEQ Benchmark (2017)	ND
SW8270	Hexachloroethane	67-72-1	No	ND	0.048	mg/kg	ND	0 / 9	1.86	TCEQ Benchmark (2017)	ND
SW8270	High Molecular Weight PAHs	HPAH	No	110	NA	mg/kg	UPSD02-000-020112	9 / 9	1.7	TCEQ Benchmark (2017)	1
SW8270	Indeno(1,2,3-cd)pyrene-T	193-39-5	No	9.7	0.048	mg/kg	UPSD02-000-020112	8 / 9	0.488	NOAA SQuRT	2
SW8270	Isophorone	78-59-1	No	ND	0.048	mg/kg	ND	0 / 9	NA	NA	ND
SW8270	Low Molecular Weight PAHs	LPAH	No	38.7	NA	mg/kg	UPSD02-000-020112	9 / 9	0.552	TCEQ Benchmark (2017)	6
SW8270	Naphthalene-L,T	91-20-3	No	2.4	0.048	mg/kg	UPSD02-000-020112	4 / 9	0.16	TCEQ Benchmark (2017)	1
SW8270	Nitrobenzene	98-95-3	No	ND	0.048	mg/kg	ND	0 / 9	2.67	TCEQ Benchmark (2017)	ND
SW8270	N-Nitrosodi-n-propylamine	621-64-7	No	0.094	0.059	mg/kg	UPSD07-000-020112	1 / 9	NA	NA	NA
SW8270	N-Nitrosodiphenylamine	86-30-6	No	ND	0.059	mg/kg	ND	0 / 9	0.028	NOAA SQuRT	ND
SW8270	Pentachlorophenol	87-86-5	Yes	ND	0.054	mg/kg	ND	0 / 9	0.36	TCEQ Benchmark (2017)	ND
SW8270	Phenanthrene-L,T	85-01-8	No	24	0.37	mg/kg	UPSD02-000-020112	9 / 9	0.24	TCEQ Benchmark (2017)	2
SW8270	Phenol	108-95-2	No	ND	0.059	mg/kg	ND	0 / 9	0.42	TCEQ Benchmark (2017)	ND
SW8270	Pyrene-H,T	129-00-0	No	24	0.24	mg/kg	UPSD02-000-020112	9 / 9	0.665	TCEQ Benchmark (2017)	2
SW8270	Total PAHs	TPAH	No	195	NA	mg/kg	UPSD02-000-020112	9 / 9	4.022	TCEQ Benchmark (2017)	3

Samples from Up River Road represent potential contributions of COPCs to the confluence of the East Ditch and the Up River Road ditch.

L - Low Molecular Weight PAH

PCB - Polychlorinated Biphenyl

NOAA SQuRT - National Oceanic and Atmospheric Agency Screening Quick Reference Tables

H - High Molecular Weight PAH

ND - Not Detected, NA - Not Applicable

TCEQ - Texas Commission on Environmental Quality

T - Total PAH

J - Estimated Value

PAH - Polycyclic Aromatic Hydrocarbon

JL - Estimated Value, Biased Low

Table 16
Surface Water Quality Standard Calculations with Site-Specific Hardness
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Cadmium

Cadmium (d)	Acute: $1.136672 - [\ln(\text{hardness})](0.041838) * (\text{we}^{(1.0166 \ln(\text{hardness}) - 2.4743)})$		Chronic: $1.101672 - [\ln(\text{hardness})](0.041838) * (\text{we}^{(0.7409 \ln(\text{hardness}) - 4.719)})$	
Hardness	Cadmium Acute 2017 (ug/L)	Cadmium Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	4.37E+00	1.52E-01	3.91E+00	3.91E+00
120 Site-specific Hardness	1.02E+01	2.79E-01	4.79E+00	4.79E+00
160 Segment 2101 IP2012	1.36E+01	3.41E-01	5.08E+00	5.16E+00
			2.69E+00	2.69E+00

Chromium

Chromium (Tri) (d)	Acute: $0.316\text{we}^{(0.8190 \ln(\text{hardness}) + 3.7256)}$		Chronic: $0.860\text{we}^{(0.8190 \ln(\text{hardness}) + 0.6848)}$	
Hardness	Chromium Acute 2017 (ug/L)	Chromium Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	3.23E+02	4.20E+01	3.91E+00	3.20E+00
120 Site-specific Hardness	6.62E+02	8.61E+01	4.79E+00	3.92E+00
160 Segment 2101 IP2012	8.37E+02	1.09E+02	5.08E+00	4.16E+00
			7.88E+00	4.84E+00

Copper

Copper (d)	Acute: $0.960\text{me}^{(0.9422 \ln(\text{hardness}) - 1.6448)}$		Chronic: $0.960\text{me}^{(0.8545 \ln(\text{hardness}) - 1.6463)}$	
Hardness	Copper Acute 2017(ug/L)	Copper Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	7.39E+00	5.24E+00	3.91E+00	3.69E+00
120 Site-specific Hardness	1.69E+01	1.11E+01	4.79E+00	4.51E+00
160 Segment 2101 IP2012	2.21E+01	1.41E+01	5.08E+00	4.78E+00
			3.14E+00	4.34E+00

Lead

Lead (d)	Acute: $1.46203 - [\ln(\text{hardness})](0.145712) * (\text{we}^{(1.273 \ln(\text{hardness}) - 1.460)})$		Chronic: $1.46203 - [\ln(\text{hardness})](0.145712) * (\text{we}^{(1.273 \ln(\text{hardness}) - 4.705)})$	
Hardness	Lead Acute 2017 (ug/L)	Lead Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	3.01E+01	1.17E+00	3.91E+00	4.98E+00
120 Site-specific Hardness	7.86E+01	3.07E+00	4.79E+00	6.09E+00
160 Segment 2101 IP2012	1.07E+02	4.18E+00	5.08E+00	6.46E+00
			5.00E+00	6.46E+00
			1.76E+00	

Nickel

Nickel (d)	Acute: $0.998\text{we}^{(0.8460 \ln(\text{hardness}) + 2.255)}$		Chronic: $0.997\text{we}^{(0.8460 \ln(\text{hardness}) + 0.0584)}$	
Hardness	Nickel Acute 2017 (ug/L)	Nickel Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	2.60E+02	2.89E+01	3.91E+00	3.31E+00
120 Site-specific Hardness	5.46E+02	6.07E+01	4.79E+00	4.05E+00
160 Segment 2101 IP2012	6.97E+02	7.74E+01	5.08E+00	4.29E+00
			6.55E+00	4.29E+00
			4.35E+00	

Zinc

Zinc (d)	Acute: $0.978\text{we}^{(0.8473 \ln(\text{hardness}) + 0.884)}$		Chronic: $0.986\text{we}^{(0.8473 \ln(\text{hardness}) + 0.884)}$	
Hardness	Zinc Acute 2017(ug/L)	Zinc Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	6.51E+01	6.57E+01	3.91E+00	3.31E+00
120 Site-specific Hardness	1.37E+02	1.38E+02	4.79E+00	4.94E+00
160 Segment 2101 IP2012	1.75E+02	1.76E+02	5.08E+00	4.30E+00
			5.18E+00	4.30E+00
			5.18E+00	

Manganese

Manganese (d)	Acute: $e^{(0.3331 \ln(\text{hardness}) + 6.4676)}$		Chronic: $e^{(0.0.3331 \ln(\text{hardness}) + 5.8743)}$	
Hardness	Manganese Acute 2017 (ug/L)	Manganese Chronic 2017 (ug/L)	Acute 2017 Calculation Steps	Chronic 2017 Calculation Steps
50 Default	2.37E+03	1.31E+03	3.91E+00	3.91E+00
120 Site-specific Hardness	3.17E+03	1.75E+03	4.79E+00	4.79E+00
160 Segment 2101 IP2012	3.49E+03	1.93E+03	5.08E+00	5.08E+00

Pentachlorophenol

Pentachlorophenol	Acute: $e^{(1.005(\text{pH}) - 4.869)}$		Chronic: $e^{(1.005(\text{pH}) - 5.134)}$	
pH			Pentachlorophenol Chronic (ug/L)	
6.0 Default			2.45E+00	
7.9 Segment 2101 IP2012			1.65E+01	

Equations from Supporting Documentation for the TCEQ's Ecological Benchmark Tables, RG-263B, January 2017

Table 17
Screening Assessment for the South Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Soil Ecological Criteria	Background Concentration (mg/kg)	Exceedance Count (0 - 0.5 feet bgs)	Maximum Detection 0 - 0.5 feet bgs (mg/kg)	Hazard Quotient 0-0.5 feet bgs	Retained / Eliminated	Exceedance Count 1 to 2 feet bgs	Maximum Detection 1 - 2 feet bgs (mg/kg)	Hazard Quotient 1-2 feet bgs (mg/kg)	Retained / Eliminated
Barium	7440-39-3	No	330	300	9	1180	3.6	Retained HQ >1	16	2220	6.7	Retained HQ >1
Cadmium	7440-43-9	Yes	32	1.42	0	6.99	0.22	Retained detected bioaccumulative	0	19.6	0.61	Retained detected bioaccumulative
Chromium	7440-47-3	Yes	0.4	30	23	178	445	Retained detected bioaccumulative; HQ>1	32	234	585	Retained detected bioaccumulative; HQ>1
Copper	7440-50-8	Yes	70	15	1	105	1.5	Retained detected bioaccumulative; HQ>1	5	234	3.3	Retained detected bioaccumulative; HQ>1
Lead	7439-92-1	Yes	120	17.3	5	277	2.3	Retained detected bioaccumulative; HQ>1	7	359	3.0	Retained detected bioaccumulative; HQ>1
Manganese	7439-96-5	No	220	300	7	490	2.2	Retained HQ >1	16	483	2.2	Retained HQ >1
Nickel	7440-02-0	Yes	38	10	0	13.6	0.36	Retained detected bioaccumulative	1	60.1	1.6	Retained detected bioaccumulative; HQ>1
Selenium	7782-49-2	Yes	0.52	0.89	5	1.7	3.3	Retained detected bioaccumulative; HQ>1	25	3.77	7.3	Retained detected bioaccumulative; HQ>1
Silver	7440-22-4	Yes	560	1.0	0	0.611	0.0011	Retained detected bioaccumulative	0	1.6	0.0029	Retained detected bioaccumulative
Vanadium	7440-62-2	No	2.0	50	23	20.5	10	Retained HQ >1	32	27.7	14	Retained HQ >1
Zinc	7440-66-6	Yes	120	102	12	2700	23	Retained detected bioaccumulative; HQ>1	9	2120	18	Retained detected bioaccumulative; HQ>1
Mercury	7439-97-6	Yes	0.10	0.0445	10	1.98	20	Retained detected bioaccumulative; HQ>1	13	23	230	Retained detected bioaccumulative; HQ>1
4,4'-DDD	72-54-8	Yes	0.758	NA	0	0.11	0.15	Retained detected bioaccumulative	0	0.086	0.11	Retained detected bioaccumulative
4,4'-DDE	72-55-9	Yes	0.596	NA	0	0.033	0.055	Retained detected bioaccumulative	ND	ND	ND	Eliminated; not detected
4,4'-DDT	50-29-3	Yes	0.021	NA	3	0.034	1.6	Retained detected bioaccumulative; HQ>1	6	0.088	4.2	Retained detected bioaccumulative; HQ>1
alpha-Chlordane	5103-71-9	Yes	0.224	NA	0	0.014	0.063	Retained detected bioaccumulative	1	0.25	1.1	Retained detected bioaccumulative; HQ>1
beta-BHC	319-85-7	Yes	0.00398	NA	1	0.23	58	Retained detected bioaccumulative; HQ>1	4	0.063	16	Retained detected bioaccumulative; HQ>1
Dieldrin	60-57-1	Yes	0.0049	NA	1	0.057	12	Retained detected bioaccumulative; HQ>1	1	0.025	5.1	Retained detected bioaccumulative; HQ>1
Endrin	72-20-8	Yes	0.0101	NA	1	0.022	2.2	Retained detected bioaccumulative; HQ>1	1	0.038	3.8	Retained detected bioaccumulative; HQ>1
Endrin aldehyde	7421-93-4	Yes	0.0105	NA	1	0.10	9.5	Retained detected bioaccumulative; HQ>1	2	0.028	2.7	Retained detected bioaccumulative; HQ>1
gamma-BHC	58-89-9	Yes	0.005	NA	1	0.013	2.6	Retained detected bioaccumulative; HQ>1	ND	ND	ND	Eliminated; not detected
gamma-Chlordane	5103-74-2	Yes	0.224	NA	0	0.21	0.94	Retained detected bioaccumulative	1	0.31	1.4	Retained detected bioaccumulative; HQ>1
Heptachlor	76-44-8	Yes	0.00598	NA	ND	ND	ND	Eliminated; not detected	1	0.069	12	Retained detected bioaccumulative; HQ>1
Heptachlor epoxide	1024-57-3	Yes	0.152	NA	0	0.017	0.11	Retained detected bioaccumulative	1	0.33	2.2	Retained detected bioaccumulative; HQ>1
Total PCBs	TPCB	Yes	40	NA	0	0.368	0.0092	Retained detected bioaccumulative	0	0.7781	0.019	Retained detected bioaccumulative
2,4-Dimethylphenol	105-67-9	No	0.010	NA	ND	ND	ND	Eliminated; not detected	3	0.19	19	Retained HQ >1
Benzaldehyde	100-52-7	No	0.255	NA	0	0.0076	0.030	Eliminated; HQ < 1	1	1.3	5.1	Retained HQ >1
Carbazole	86-74-8	No	0.0994	NA	0	0.019	0.19	Eliminated; HQ < 1	1	0.45	4.5	Retained HQ >1
Dibenzofuran	132-64-9	No	0.0994	NA	0	0.075	0.75	Eliminated; HQ < 1	2	0.19	1.9	Retained HQ >1
High Molecular Weight PAHs	HPAH	No	1.1	NA	0	1.051	1.0	Eliminated; HQ = 1	8	29.5	27	Retained HQ >1
Cyanide	57-12-5	No	1.33	NA	7	6.95	5.2	Retained HQ >1	1	2.34	1.8	Retained HQ >1

This table presents a subset of the South Pit soil data organized by 0-0.5 ft bgs and 1-2 ft bgs. These COPCs were retained on Table 1 using the 0-2 ft bgs data set.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark.

Table 1 presents the entire data set (0-2 ft) for the South Pit exposure area.

Background concentrations presented for information only and not used to remove COPCs from further assessment.

PCB - Polychlorinated Biphenyl

PAH - Polycyclic Aromatic Hydrocarbon

ND - Not detected

Table 18
Screening Assessment for the North Pit Soils (0 to 2 feet bgs)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Soil Ecological Criteria	Background Concentration (mg/kg)	Exceedance Count (0 - 0.5 feet bgs)	Maximum Detection 0 - 0.5 feet bgs (mg/kg)	Hazard Quotient 0-0.5 feet bgs	Retained / Eliminated	Exceedance Count 1 to 2 feet bgs	Maximum Detection 1 - 2 feet bgs (mg/kg)	Quotient 1-2 feet bgs (mg/kg)	Retained / Eliminated
Arsenic	7440-38-2	No	18	5.9	0	8.7	0.48	Eliminated HQ < 1	2	32.3	1.8	Retained HQ >1
Barium	7440-39-3	No	330	300	21	11,800	36	Retained HQ >1	7	2920	8.8	Retained HQ >1
Cadmium	7440-43-9	Yes	32	1.42	0	15.6	0.49	Retained detected bioaccumulative	3	67.2	2.1	Retained detected bioaccumulative; HQ>1
Chromium	7440-47-3	Yes	0.4	30	25	61.8	155	Retained detected bioaccumulative; HQ>1	29	14.5	36	Retained detected bioaccumulative; HQ>1
Copper	7440-50-8	Yes	70	15	0	34.5	0.49	Retained detected bioaccumulative	4	475	6.8	Retained detected bioaccumulative; HQ>1
Lead	7439-92-1	Yes	120	17.3	5	1800	15	Retained detected bioaccumulative; HQ>1	8	858	7.2	Retained detected bioaccumulative; HQ>1
Manganese	7439-96-5	No	220	300	7	379	1.7	Retained HQ >1	17	584	2.7	Retained HQ >1
Nickel	7440-02-0	Yes	38	10	0	15.4	0.41	Retained detected bioaccumulative	0	10.6	0.28	Retained detected bioaccumulative
Selenium	7782-49-2	Yes	0.52	0.89	11	12.0	23	Retained detected bioaccumulative; HQ>1	26	12.8	25	Retained HQ >1
Silver	7440-22-4	Yes	560	1.0	0	0.641	0.0011	Retained detected bioaccumulative	0	10.2	0.018	Retained detected bioaccumulative
Vanadium	7440-62-2	No	2.0	50	25	25.4	13	Retained HQ >1	39	25.4	13	Retained HQ >1
Zinc	7440-66-6	Yes	120	102	20	2430	20	Retained detected bioaccumulative; HQ>1	15	13,700	114	Retained detected bioaccumulative; HQ>1
Mercury	7439-97-6	Yes	0.10	0.0445	26	8.97	90	Retained detected bioaccumulative; HQ>1	20	58.1	581	Retained detected bioaccumulative; HQ>1
4,4'-DDD	72-54-8	Yes	0.758	NA	0	0.045	0.059	Retained detected bioaccumulative	ND	ND	ND	Eliminated; not detected
4,4'-DDT	50-29-3	Yes	0.021	NA	0	0.01	0.48	Retained detected bioaccumulative	0	0.003	0.14	Retained detected bioaccumulative
Aldrin	309-00-2	Yes	0.00332	NA	1	0.024	7.2	Retained detected bioaccumulative; HQ>1	ND	ND	ND	Eliminated; not detected
beta-BHC	319-85-7	Yes	0.00398	NA	0	0.0024	0.60	Retained detected bioaccumulative	1	0.012	3.0	Retained detected bioaccumulative; HQ>1
Endrin	72-20-8	Yes	0.0101	NA	1	0.061	6.0	Retained detected bioaccumulative; HQ>1	ND	ND	ND	Eliminated; not detected
Endrin aldehyde	7421-93-4	Yes	0.0105	NA	2	0.02	1.9	Retained detected bioaccumulative; HQ>1	ND	ND	ND	Eliminated; not detected
Total PCBs	TPCB	Yes	40	NA	0	0.0325	8.1E-04	Retained detected bioaccumulative	0	0.0364	9.1E-04	Retained detected bioaccumulative
Bis(2-ethylhexyl)phthalate	117-81-7	No	0.925	NA	1	84	91	Retained HQ >1	0	0.061	0.066	Eliminated HQ < 1
High Molecular Weight PAHs	HPAH	No	1.1	NA	6	2.58	2.3	Retained HQ >1	2	2.95	2.7	Retained HQ >1
Pentachlorophenol	87-86-5	Yes	5.0	NA	0	ND	ND	Eliminated; not detected	0	0.012	0.0024	Retained detected bioaccumulative
Cyanide	57-12-5	No	1.33	NA	7	34.3	26	Retained HQ >1	1	2.3	1.7	Retained HQ >1

Table presents a subset of the North Pit soil data organized by 0-0.5 ft bgs and 1-2 ft bgs. These COPCs were retained on Table 2 using the 0-2 ft bgs data set.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

Table 2 presents the entire data set for the North Pit exposure area.

Background concentrations presented for information only and not used to remove COPCs from further assessment.

PCB - Polychlorinated Biphenyl

PAH - Polycyclic Aromatic Hydrocarbon

ND - Not detected

Table 19
Screening Assessment for East Ditch Surface Water (South)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Surface Water Freshwater Acute Criteria	Exceedance Count - Acute	Hazard Quotient (HQ)	Retained / Eliminated
Aluminum	7429-90-5	D	No	1.12	0.99	5	1.1	Retained HQ >1
4,4'-DDD	72-54-8	N	Yes	4.20E-06	1.89E-04	0	0.022	Eliminated HQ < 1
4,4'-DDE	72-55-9	N	Yes	6.60E-06	3.30E-03	0	0.0020	Eliminated HQ < 1
4,4'-DDT	50-29-3	N	Yes	1.10E-05	1.10E-03	0	0.010	Eliminated HQ < 1
gamma-Chlordane	5103-74-2	N	No	8.30E-06	2.40E-03	0	0.0035	Eliminated HQ < 1
Heptachlor	76-44-8	N	No	4.10E-06	5.20E-04	0	0.0079	Eliminated HQ < 1
Total PAHs (pyrene)	TPAH	N	No	0.000064	0.206	0	3.1E-04	Eliminated HQ < 1

The southern portion of the East Ditch is intermittent and therefore; elimination of a surface water COPC was based on the Freshwater Acute Criteria.
Pyrene was the only PAH detected and therefore the detected concentration and criteria only apply for pyrene.

T - Total Metals

N - Total/Dissolved not applicable

PAHs - Polycyclic aromatic hydrocarbons

Table 20
Screening Assessment for East Ditch Sediment (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Maximum Detection (mg/kg)	Sediment Freshwater Criteria	Screening Exceedance Count	95 % UCL (mg/kg)	TCEQ Benthic PCL (mg/kg)	Benthic PCL Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated as Final Benthic COPC*
Antimony	7440-36-0	No	0.369	0.3	1	NA	6.15	0	0.06	Eliminated; HQ < 1 using Max as EPC and TCEQ Benthic PCL
Barium	7440-39-3	No	2690	NA	NA	1347	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Beryllium	7440-41-7	No	0.621	NA	NA	0.488	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Cadmium	7440-43-9	Yes	3.32	0.99	1	1.48	2.985	0	0.49	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Copper	7440-50-8	Yes	21.5	31.6	0	12.5	106.1	0	0.12	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Lead	7439-92-1	No	77	35.8	3	39.9	81.9	0	0.49	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Manganese	7439-96-5	No	559	460	3	361	780	0	0.46	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Nickel	7440-02-0	Yes	8.53	22.7	0	6.60	48.6	0	0.14	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Selenium	7782-49-2	Yes	0.757	NA	NA	0.512	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Thallium	7440-28-0	No	0.288	NA	NA	0.188	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Vanadium	7440-62-2	No	19.8	NA	NA	15	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Zinc	7440-66-6	Yes	545	121	2	242.9	290	1	0.8	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Mercury	7439-97-6	Yes	0.25	0.18	1	0.124	0.62	0	0.20	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
4,4'-DDT	50-29-3	Yes	0.024	0.00416	1	--	0.03	0	0.0080	Eliminated; HQ < 1 using Max as EPC and TCEQ Benthic PCL
beta-BHC	319-85-7	Yes	0.04	0.005	1	--	0.11	0	3.8E-04	Eliminated; HQ < 1 using Max as EPC and TCEQ Benthic PCL
gamma-Chlordane	5103-74-2	Yes	0.028	0.00324	1	--	0.01	1	2.8	Retained as a final benthic COPC, 1 out of 9 detections
Bis(2-ethylhexyl)phthalate	117-81-7	No	0.57	0.5	1	0.26	11.3	0	0.023	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Total PAHs	TPAH	No	1.87	1.61	1	0.733	12.205	0	0.15	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Cyanide	57-12-5	No	0.99	NA	NA	--	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available

*Bolded COPCs are final benthic community COPCs, all listed COPCs are evaluated in the trophic analysis.

This table lists the COPCs moving forward for evaluation in the trophic analysis. This table also presents an assessment of the risk to benthic invertebrates in the Southern portion of the East Ditch.

Table 5 presents a summary of the sediment data from the Southern portion of the East Ditch.

PAH - Polycyclic Aromatic Hydrocarbon

NA - Not Applicable

PCL = Protective Concentration Level

Bold indicates SLERA COC for this medium

Table 21
Screening Assessment for East Ditch Riparian Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Soil Ecological Criteria	Background Concentration (mg/kg)	Exceedance Count 0 - 0.5 feet bgs	Maximum Detection 0 - 0.5 feet bgs (mg/kg)	Hazard Quotient (HQ) 0-0.5 feet bgs	Retained / Eliminated	Exceedance Count 1 to 2 feet bgs	Maximum Detection 1 - 2 feet bgs (mg/kg)	Hazard Quotient (HQ) 1-2 feet bgs (mg/kg)	Retained / Eliminated
Barium	7440-39-3	No	330	300	1	467	1.4	Retained HQ >1	2	1310	4.0	Retained HQ >1
Cadmium	7440-43-9	Yes	32	1.42	0	0.214	0.0067	Retained detected bioaccumulative	0	0.456	0.014	Retained detected bioaccumulative
Chromium	7440-47-3	Yes	0.4	30	5	5.86	15	Retained detected bioaccumulative; HQ>1	3	7.35	18	Retained detected bioaccumulative; HQ>1
Copper	7440-50-8	Yes	70	15	0	6.04	0.086	Retained detected bioaccumulative	0	13.7	0.20	Retained detected bioaccumulative
Lead	7439-92-1	Yes	120	15	0	10.5	0.088	Retained detected bioaccumulative	0	84.8	0.71	Retained detected bioaccumulative
Manganese	7439-96-5	No	220	300	0	220	1.0	Eliminated; HQ = 1	2	297	1.4	Retained HQ >1
Nickel	7440-02-0	Yes	38	10	0	5.51	0.15	Retained detected bioaccumulative	0	6.95	0.18	Retained detected bioaccumulative
Selenium	7782-49-2	Yes	0.52	0.89	2	1.19	2.3	Retained detected bioaccumulative; HQ>1	3	1.43	2.8	Retained detected bioaccumulative; HQ>1
Vanadium	7440-62-2	No	2.0	50	5	13.4	6.7	Retained HQ >1	3	13.8	6.9	Retained HQ >1
Zinc	7440-66-6	Yes	120	102	0	25.9	0.22	Retained detected bioaccumulative	0	72.9	0.61	Retained detected bioaccumulative
Mercury	7439-97-6	Yes	0.10	0.0445	0	0.0133	0.13	Retained detected bioaccumulative	0	0.0244	0.24	Retained detected bioaccumulative
4,4'-DDT	50-29-3	Yes	0.021	NA	0	0.0029	0.14	Retained detected bioaccumulative	ND	ND	ND	Eliminated; not detected
Cyanide	57-12-5	No	1.33	NA	2	4.55	3.4	Retained HQ >1	0	1.20	0.90	Eliminated; HQ < 1

This table presents a subset of the East Ditch Riparian soil data organized by 0-0.5 ft bgs and 1-2 ft bgs. Data are screened against soil benchmarks using maximum detected concentration.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark..

Table 6 presents the entire data set for the East Ditch riparian exposure area.

Background concentrations presented for information only and not used to remove COPCs from further assessment.

ND - Not detected

Table 22
Screening Assessment for East Ditch Sediments as Soils (South)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Soil Ecological Criteria	Background Concentration (mg/kg)	Maximum Detection (mg/kg)	Exceedance Count 0 to 0.5 feet bgs	Hazard Quotient (HQ)	Retained / Eliminated
Barium	7440-39-3	No	330	300	1347	13	4.1	Retained HQ >1
Cadmium	7440-43-9	Yes	32	1.42	3.32	0	0.10	Retained detected bioaccumulative
Chromium	7440-47-3	Yes	0.4	30	11.9	14	30	Retained detected bioaccumulative; HQ>1
Copper	7440-50-8	Yes	70	15	21.5	0	0.31	Retained detected bioaccumulative
Lead	7439-92-1	Yes	120	17.3	77	0	0.64	Retained detected bioaccumulative
Manganese	7439-96-5	No	220	300	559	10	2.5	Retained HQ >1
Nickel	7440-02-0	Yes	38	10	8.53	0	0.22	Retained detected bioaccumulative
Selenium	7782-49-2	Yes	0.52	0.89	0.757	4	1.5	Retained detected bioaccumulative; HQ>1
Silver	7440-22-4	Yes	560	1	0.213	0	3.8E-04	Retained detected bioaccumulative
Vanadium	7440-62-2	No	2.0	50	19.8	14	9.9	Retained HQ >1
Zinc	7440-66-6	Yes	120	102	545	2	4.5	Retained detected bioaccumulative; HQ>1
Mercury	7439-97-6	Yes	0.10	0.0445	0.25	2	2.5	Retained detected bioaccumulative; HQ>1
4,4'-DDT	50-29-3	Yes	0.021	NA	0.024	1	1.1	Retained detected bioaccumulative; HQ>1
beta-BHC	319-85-7	Yes	0.00398	NA	0.04	1	10	Retained detected bioaccumulative; HQ>1
gamma-Chlordane	5103-74-2	Yes	0.224	NA	0.028	0	0.13	Retained detected bioaccumulative
High Molecular Weight PAHs	HPAH	No	1.1	NA	1.64	1	1.5	Retained HQ >1

This table presents a subset of the East Ditch Sediment as Soil data 0-0.5 ft bgs. Data are screened against soil benchmarks using maximum detected concentrations.

COPCs retained if hazard quotient (HQ) is > 1 or if the constituent was detected and is considered bioaccumulative.

HQs determined using maximum detected concentration and the conservative screening level soil benchmark.

Table 7 presents the entire data set for the East Ditch South Soil exposure area.

Background concentrations presented for information only and not used to remove COPCs from further assessment.

PAH - Polycyclic Aromatic Hydrocarbon

No 1- to 2-feet bgs samples were collected

Table 23
Screening Assessment for East Ditch Surface Water (North)
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Method	Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Surface Water Marine Chronic Criteria	Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated
SW6020	Aluminum	7429-90-5	T	No	2.11	0.75	6	2.8	Retained; HQ >1
SW6020	Cobalt	7440-48-4	T	No	0.00662	0.001	6	6.6	Retained; HQ >1
SW6020	Manganese	7439-96-5	T	No	2.7	0.10	9	27	Retained; HQ >1
SW6020	Selenium	7782-49-2	T	Yes	0.00476	0.136	0	0.035	Retained as detected bioaccumulative
SW7470	Mercury	7439-97-6	T	Yes	0.000074	0.0011	0	0.067	Retained as detected bioaccumulative
SW8081	4,4'-DDD	72-54-8	N	Yes	0.0000056	0.000025	0	0.22	Retained as detected bioaccumulative*
SW8081	4,4'-DDE	72-55-9	N	Yes	0.00001	0.0014	0	0.0071	Retained as detected bioaccumulative*
SW8081	4,4'-DDT	50-29-3	N	Yes	0.000048	1.00E-06	4	48	Retained; HQ > 1 detected bioaccumulative*
SW8081	alpha-Chlordane	5103-71-9	N	No	0.0000075	4.00E-06	1	1.9	Retained; HQ >1
SW8081	beta-BHC	319-85-7	N	No	0.000061	1.60E-05	3	3.8	Retained; HQ >1
SW8081	Endrin aldehyde	7421-93-4	N	No	0.000014	2.00E-06	1	7.0	Retained; HQ >1
SW8081	Heptachlor	76-44-8	N	No	0.000014	4.00E-06	2	3.5	Retained; HQ >1
SW8081	Heptachlor epoxide	1024-57-3	N	No	0.000016	3.60E-06	2	4.4	Retained; HQ >1
SW8081	Methoxychlor	72-43-5	N	No	0.000056	3.00E-05	1	1.9	Retained; HQ >1

The northern portion of the East Ditch is perennial and therefore only chronic saltwater criteria are applied.

T - Total Metals

N - Total/Dissolved not applicable

PAHs - Polycyclic aromatic hydrocarbons

*4,4'-DDD detected in sediment < 5% frequency, 4-4'-DDT and 4,4'-DDE were not detected in sediment. These COPCs are not evaluated in the trophic analysis.

Table 24
Screening Assessment for East Ditch Sediment (North)
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Bioaccumulative COPC?	Max Detection (mg/kg)	Sediment Marine Criteria	Screening Exceedance Count	95 % UCL (mg/kg)	TCEQ Benthic PCL (mg/kg)	Benthic PCL Exceedance Count	Hazard Quotient (HQ)	Retained / Eliminated as Final Benthic COPC*
Arsenic	7440-38-2	No	37.8	8.2	6	--	39.1	0	0.97	Eliminated; HQ < 1 using Maximum as EPC and TCEQ Benthic PCL
Barium	7440-39-3	No	4730	130.1	22	2704	715	10	3.8	Retained; HQ > 1 using 95% UCL as EPC and TCEQ Benthic PCL
Beryllium	7440-41-7	No	0.541	NA	NA	0.382	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Cadmium	7440-43-9	Yes	3.76	1.2	9	--	5.4	0	0.70	Eliminated; HQ < 1 using Maximum as EPC and TCEQ Benthic PCL
Cobalt	7440-48-4	No	14.5	10	1	--	30	0	0.48	Eliminated; HQ < 1 using Maximum as EPC and TCEQ Benthic PCL
Copper	7440-50-8	Yes	91.5	34	1	--	152	0	0.60	Eliminated; HQ < 1 using Maximum as EPC and TCEQ Benthic PCL
Lead	7439-92-1	No	225	46.7	6	65.66	132.35	2	0.50	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Manganese	7439-96-5	No	2590	260	12	945.3	1430	2	0.66	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Nickel	7440-02-0	Yes	9.75	20.9	0	--	36.25	0	0.27	Eliminated; HQ < 1 using Maximum as EPC and TCEQ Benthic PCL
Selenium	7782-49-2	Yes	1.39	1.0	3	0.844	5.5	0	0.15	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Thallium	7440-28-0	No	0.297	NA	NA	0.142	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Zinc	7440-66-6	Yes	408	150	14	239.3	280	4	0.85	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Mercury	7439-97-6	Yes	0.533	0.15	10	0.245	0.43	2	0.57	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Endosulfan sulfate	1031-07-8	No	0.023	NA	NA	--	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available
Heptachlor	76-44-8	Yes	0.023	0.0006	2	--	0.0017	2	14	Retained; HQ > 1 using Maximum as EPC and TCEQ Benthic PCL
Bis(2-ethylhexyl)phthalate	117-81-7	No	1.6	0.182	2	0.432	1.41	0	0.31	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Carbazole	86-74-8	No	0.77	0.16	2	0.228	0.37	1	0.62	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
High Molecular Weight PAHs	HPAH	No	40.1	1.7	3	11.62	5.65	2	2.1	Retained; HQ > 1 using 95% UCL as EPC and TCEQ Benthic PCL
Low Molecular Weight PAHs	LPAH	No	5.605	0.552	4	2.026	1.86	4	1.1	Retained; HQ > 1 using 95% UCL as EPC and TCEQ Benthic PCL
Total PAHs	TPAH	No	60.94	4.022	3	17.98	24.41	2	0.74	Eliminated; HQ < 1 using 95% UCL as EPC and TCEQ Benthic PCL
Cyanide	57-12-5	No	3.03	NA	NA	1.125	NA	NA	NA	Retained by default, screening criteria and benthic PCLs not available

*Bolded COPCs are final benthic community COPCs, all listed COPCs are evaluated in the trophic analysis.

This table lists the COPCs moving forward for evaluation in the trophic analysis. This table also presents an assessment of the risk to benthic invertebrates in the Northern portion of the East Ditch.

Table 8 presents a summary of the sediment data from the Northern portion of the East Ditch.

PAH - Polycyclic Aromatic Hydrocarbon

NA - Not Applicable

PCL = Protective Concentration Level

UCL = upper confidence limit

EPC = exposure point concentration

PCL for cobalt estimated using NOAA SQuiRT AET of 10 mg/kg and LEL of 50 mg/kg

PCL for selenium assumed by applying a factor of 10 to the AET of 1 mg/kg

PCL for barium assumed by applying a factor of 10 to the TEL of 130 mg/kg.

PCL for manganese assumed by applying a factor of 10 to the AET of 260 mg/kg.

Table 25
Screening Assessment for Groundwater Potentially Discharging to South Segment of the East Ditch
Screening Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Units	Surface Water Freshwater Acute Criteria	Exceedance Count - Acute	Hazard Quotient (HQ)	Retained / Eliminated
Cadmium	7440-43-9	D	No	0.000565	mg/l	0.0136	0	0.042	Eliminated; HQ < 1
Chromium	7440-47-3	D	No	0.174	mg/l	0.837	0	0.21	Eliminated; HQ < 1
Copper	7440-50-8	D	No	0.0403	mg/l	0.0221	1	1.8	Retained; HQ > 1
Lead	7439-92-1	D	No	0.0162	mg/l	0.107	0	0.15	Eliminated; HQ < 1
Nickel	7440-02-0	D	No	0.0828	mg/l	0.697	0	0.12	Eliminated; HQ < 1
Selenium	7782-49-2	T	Yes	0.00383	mg/l	0.02	0	0.19	Retained as detected bioaccumulative
Vanadium	7440-62-2	T	No	0.0667	mg/l	0.284	0	0.23	Eliminated; HQ < 1
Mercury	7439-97-6	T	Yes	0.000152	mg/l	0.0024	0	0.063	Retained as detected bioaccumulative
Dieldrin	60-57-1	N	No	0.0049	mg/l	2.40E-04	1	20	Retained; HQ > 1
gamma-BHC	58-89-9	N	No	0.0021	mg/l	1.13E-03	1	1.9	Retained; HQ > 1
Heptachlor	76-44-8	N	No	0.0025	mg/l	5.20E-04	1	4.8	Retained; HQ > 1
1,2,4-Trimethylbenzene	95-63-6	N	No	0.17	mg/l	0.462	0	0.37	Eliminated; HQ < 1
1,3,5-Trimethylbenzene	108-67-8	N	No	0.10	mg/l	0.4245	0	0.24	Eliminated; HQ < 1
Benzene	71-43-2	N	No	0.53	mg/l	2.3	0	0.23	Eliminated; HQ < 1
Ethylbenzene	100-41-4	N	No	2.0	mg/l	3.0	0	0.67	Eliminated; HQ < 1
Naphthalene	91-20-3	N	No	0.35	mg/l	1.48	0	0.24	Eliminated; HQ < 1
Xylenes, Total	1330-20-7	N	No	2.1	mg/l	4.02	0	0.52	Eliminated; HQ < 1
1,1'-Biphenyl	92-52-4	N	No	0.026	mg/l	0.14	0	0.19	Eliminated; HQ < 1
1-Methylnaphthalene	90-12-0	N	No	0.15	mg/l	0.037	1	4.1	Retained HQ > 1
2,4-Dimethylphenol	105-67-9	N	No	3.6	mg/l	0.63	1	5.7	Retained HQ > 1
2-Methylnaphthalene	91-57-6	N	No	0.30	mg/l	0.38	0	0.79	Eliminated; HQ < 1
2-Methylphenol	95-48-7	N	No	3.1	mg/l	3.36	0	0.92	Eliminated; HQ < 1
Anthracene	120-12-7	N	No	0.0018	mg/l	0.0018	0	1.0	Eliminated HQ = 1
Benzo(a)pyrene	50-32-8	N	No	0.0022	mg/l	2.40E-04	1	9.2	Retained; HQ > 1
Fluorene	86-73-7	N	No	0.012	mg/l	0.064	0	0.19	Eliminated; HQ < 1
Naphthalene	91-20-3	N	No	0.26	mg/l	1.48	0	0.18	Eliminated; HQ < 1
Phenanthrene	85-01-8	N	No	0.039	mg/l	0.03	1	1.3	Retained HQ > 1
Total PAHs	TPAH	N	No	0.79	mg/l	NA	NA	NA	Retained, no screening benchmark
Cyanide	57-12-5	T	No	0.131	mg/l	0.0458	1	2.9	Retained; HQ > 1

The southern portion of the East Ditch is intermittent and therefore elimination of a surface water COPC was based on the freshwater acute criteria.

No acute values available for 1,1-biphenyl therefore a factor of 10 was applied to the chronic value.

T - Total Metals

D - Dissolved Metals

N - Total/Dissolved not applicable

NA- Not Available

Table 26
Screening Assessment for Groundwater Discharging to North Segment of the East Ditch
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Analyte	CAS No.	Total or Dissolved	Bioaccumulative COPC?	Maximum Detection (mg/L)	Sample with Maximum Detection	Detections Count	Surface Water Marine Chronic Criteria	Reference	Representative Concentration ^a	Representative Concentration exceeds Marine Criteria?	Tier 1 Surface Water Criteria Modified by Default Dilution Factor ^b	Representative Concentration exceeds Tier 1 Criteria?	Tier 2 Surface Water Criteria Modified by Site-Specific Dilution Factor ^c	Representative Concentration exceeds Tier 2 Criteria?
Cobalt	7440-48-4	T	No	3.73E-02	MWGW16-022614	2 / 4	1.00E-03	NOAA SQuiRT Australian & New Zealand Chronic	1.38E-02	Yes	6.67E-03	Yes	2.72E-01	No
Manganese	7439-96-5	D	No	2.13E+00	MWGW16-022614	4 / 4	1.00E-01	NOAA SQuiRT British Columbia Chronic Value	1.04E+00	Yes	6.67E-01	Yes	2.72E+01	No
Nickel	7440-02-0	D	No	1.66E-02 J	MWGW16-022614	3 / 4	1.31E-02	TCEQ Benchmark (2017)	6.54E-03	No	8.73E-02	No	3.57E+00	No
Selenium	7782-49-2	T	Yes	1.26E-02 J	MWGW16-022614	3 / 4	1.36E-01	TCEQ Benchmark (2017)	6.31E-03	No	9.07E-01	No	3.71E+01	No
4,4'-DDT	50-29-3	N	Yes	2.10E-05	MWGW05-022614	1 / 4	1.00E-06	TCEQ Benchmark (2017)	1.49E-05	Yes	6.67E-06	Yes	2.72E-04	No
Endosulfan I	959-98-8	N	No	6.50E-05	MWGW04-022614	3 / 4	9.00E-06	TCEQ Benchmark (2017)	1.89E-05	Yes	6.00E-05	No	2.45E-03	No
Endosulfan sulfate	1031-07-8	N	No	2.30E-05	MWGW15-022614	1 / 4	9.00E-06	TCEQ Benchmark (2017)	1.56E-05	Yes	6.00E-05	No	2.45E-03	No
gamma-Chlordane	5103-74-2	N	No	6.70E-05	MWGW15-022614	1 / 4	4.00E-06	TCEQ Benchmark (2017)	2.58E-05	Yes	2.67E-05	No	1.09E-03	No
Heptachlor	76-44-8	N	No	3.10E-05	MWGW15-022614	1 / 4	4.00E-06	TCEQ Benchmark (2017)	1.22E-05	Yes	2.67E-05	No	1.09E-03	No
Heptachlor epoxide	1024-57-3	N	No	2.90E-05	MWGW15-022614	1 / 4	3.60E-06	TCEQ Benchmark (2017)	1.18E-05	Yes	2.40E-05	No	9.81E-04	No

T - Total Metals

TCEQ - Texas Commission on Environmental Quality

D - Dissolved Metals

NOAA SQuiRT - National Oceanic and Atmospheric Agency Screening Quick Reference Tables

N - Total/Dissolved not applicable

J - Estimated Value

^a - Representative concentrations calculated using TRRP-15eco: Discharge Weighted Representative Groundwater COC Concentration at Surface Water Interface (v 1.2 Oct 2012)

^b - Adjusted for default dilution factor of 0.15 per 30 TAC 350.75(i)(4)

^c - Site-specific DF = Qgw/(Qgw+Qsw) = 3.68E-04/(0.1+0.000368) = 3.67E-03

No final COCs for this medium

Table 27
Ecological Attributes and Assessment Endpoints from Feeding Guilds and Communities
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Community / Feeding Guild	Receptors	Critical Ecological Attribute/Assessment Endpoint
Soil Receptors in South Pit and North Pit Soils and South Segment of East Ditch		
Terrestrial Plants	Vascular plants, Grasses and Forbs	Primary producers are a critical food source and are the first link in the terrestrial food chain for higher trophic level consumers. Vegetation provides critical habitat for wildlife. Assessment endpoint - preservation of the viability of upper trophic level receptors utilizing this community as habitat and food source.
Terrestrial Invertebrates	Insects, Gastropods, Oligochaetes, Arthropods and Nematodes	Terrestrial invertebrates are a food source for higher trophic level consumers. As decomposers/detritivores they play a role in nutrient cycling. Assessment endpoint - preservation of the viability of upper trophic level receptors utilizing this community as food source.
Herbivorous Mammals	Deer Mouse, Eastern Cottontail, Texas pocket gopher	Herbivorous mammals are prey for higher trophic level predators. They are important in seed dispersal and pollination for many plants. Assessment Endpoint – Preservation of the productivity of this guild.
Herbivorous Birds	Mourning Dove	Herbivorous birds are prey for higher trophic level predators. They are important in seed dispersal for many plants. Assessment Endpoint – Preservation and possible enhancement of the productivity of this guild.
Omnivorous Mammals	White-Footed Mouse, Opossum, Ground Squirrel, Raccoon, Least Shrew, Marsh Rice Rat, Nine-banded armadillo	Omnivorous mammals are prey for higher trophic level predators and influence lower trophic level populations through predation. They play an important role in seed dispersal for many types of plants. Assessment Endpoint – Preservation of the productivity of this guild.
Omnivorous Birds	Red-Winged Blackbird, Bobwhite, American Robin, Marsh Wren	Omnivorous birds are prey for higher trophic level predators. They are important in seed dispersal for many plants. Assessment Endpoint – Preservation of the productivity of this guild.
Omnivorous Amphibians / Reptiles	Ornate Box Turtle, Snapping Turtle, Southern Leopard Frog	Omnivorous reptiles provide an important food source for predators. Assessment Endpoint – Preservation of the productivity of this guild.
Carnivorous Mammals	Common Gray Fox, Coyote, Spotted Skunk	Carnivorous mammals regulate lower trophic level prey populations. Assessment Endpoint – Preservation of the productivity of this guild.
Carnivorous Birds	Eastern Screech Owl, Red-Tailed Hawk	Carnivorous birds regulate populations of lower trophic level prey. Assessment Endpoint – Preservation of the productivity of this guild.
Carnivorous Shore Birds	Spotted Sandpiper, Great Blue Heron, Snowy Egret, American Bittern, Black-Crowned Night Heron	Carnivorous shore birds regulate lower trophic level populations and influencing species composition in terrestrial and aquatic ecosystems. They also provide egg dispersal for some fish and aquatic invertebrates. Assessment Endpoint – Preservation of the productivity of this guild.
Carnivorous Amphibians / Reptiles	Texas Rat Snake, Bullfrog, King Snake, Texas Indigo Snake	Carnivorous reptiles regulate lower trophic level prey populations. Assessment Endpoint – Preservation of the productivity of this guild.
Aquatic Receptors in the East Ditch		
Aquatic Vegetation	Reeds, Sedges, Cattails, Grasses and Rushes	Primary producers are the first link in aquatic food chains supporting higher trophic level aquatic consumers and wildlife. Rooted vegetation provides habitat and bottom stability. Assessment endpoint - preservation of the viability of upper trophic level receptors utilizing this community as habitat and food source.
Water Column Invertebrates	Zooplankton and Insects	Aquatic invertebrates are a food source for many higher trophic level consumers. Zooplankton regulate phytoplankton populations, and are a critical link in energy transfer to higher trophic levels in aquatic ecosystems. Assessment endpoint - preservation of the viability of upper trophic level receptors utilizing this community as habitat and food source.

Herbivorous / Planktivorous Fish	Fathead minnow and Mosquito Fish	Herbivorous/planktivorous fish are a prey species for higher trophic level predators in aquatic and terrestrial ecosystems. They generally comprise the majority of tissue biomass in aquatic ecosystems and regulate algae and plankton biomass. Assessment endpoint - preservation of the productivity of this guild.
Sediment Receptors in the East Ditch		
Benthic Invertebrates	Crayfish, Snails, Clams, Annelids, Insects and Amphipods	Benthic invertebrates are a food source for many higher trophic level consumers. They provide a role as decomposers/detritivores in nutrient cycling. Assessment endpoint - preservation of the function and productivity of this guild.

Table 28
Exposure Assumptions for Wildlife Measurement Receptors
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Common Name	Scientific Name	Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day DW)	Water Ingestion Rate (L/day)	Soil Ingestion (% of diet)	Sediment Ingestion (% of diet)	Home Range (Acres) j
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028 a	0.059 b	0.060 b	2.8 d	--	1722
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773 a	0.011 b	0.011 b	5.2 d	--	1.04
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115 a	0.014 b	0.014 b	9.3 d	--	40
Snowy Egret	<i>Egretta thula</i>	Carnivore	0.371 a	0.031 b	0.030 b	--	7.3 f	21
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415 a	0.0073 b	0.007 b	2 d		6.9
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148 e	0.0021 c	0.0022 c	2 f	--	0.25
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558 e	0.0022 c	0.0023 c	7 d	--	0.5
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218e	0.081c	0.12 c	6.3 d	--	7
Raccoon	<i>Procyon lotor</i>	Omnivore	5.63 e	0.28 c	0.47 c	--	9.4 f	1558
Coyote	<i>Canis latrans</i>	Carnivore	14g	0.60c	1.06c	2.8 d	--	5485
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4 g	0.032c	0.043c	7.7f		1.3
Nine-banded Armadillo	<i>Dasypus novemcinctus</i>	Omnivore	4 g	0.21c	0.34c	17 f		8
Texas indigo snake	<i>Draymarchon corais erubennus</i>	Carnivore	2.26 h	0.015i	--	2.8 f	--	229

Notes

- a - The lower of the average male or female body weight was used if available (Dunning 1993).
- b - Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt0.651 (kg) from USEPA 1993. Food ingestion rate for all birds. Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt0.67 (kg) from USEPA 1993. Water ingestion for all birds.
- c - Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt0.822 (kg) from USEPA 1993. Food ingestion rate for all mammals. Water ingestion rates for mammals determined using WI (L/day) = 0.099 Wt0.90 (kg) from USEPA 1993. Water ingestion for all mammals.
- d - Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.
- e - Wildlife Exposure Factors Handbook (USEPA, 1993) conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and raccoon.
- f - Estimates of Soil Ingestion by Wildlife (Beyer, 1994). Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003). Least sandpiper used as surrogate. Egrets do not forage as deep in sediment as sandpipers. Soil ingestion taken directly from Beyer et. al. (1994) for raccoon. Coyote used as a surrogate for the snake.
- g - The lower adult body weight was used (Davis and Schmidly 1994).
- h - Herps of Texas. www.herptsoftexas.org
- i - Nagy 2001 for carnivorous reptiles
- j - Home ranges from TCEQ Database except snake (Werler and Dixon, 2000) and Snowy Egret (see text discussion). Black tailed prairie dog used as surrogate for Texas pocket gopher.
- kg - kilogram
- DW - dry weight
- L - liters

Table 29
Assumed Dietary Compositions for Wildlife Measurement Receptors
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Common Name	Percent of Components in Receptor Diet								Reference
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals	Terrestrial Birds	Aquatic Vascular Plants	Water Column Insects	Benthic Invertebrates	Fish	
Birds									
Red-Tailed Hawk			100						USEPA 1993
American Robin	50	50							USEPA 1993; Wheelwright 1986
Mourning Dove	100								USEPA 1993
Snowy Egret					5	20	70	5	Terres 1980
Red-winged Blackbird	73	27							Terres 1980
Mammals									
White Footed Mouse	50	50							USEPA 1993
Eastern Cottontail	100								USEPA 1993
Coyote			100						Davis and Schmidly 1994
Raccoon				5	5	55	25	10	USEPA 1993
Least Shrew		100							USEPA 1993
Texas Pocket Gopher	100								Davis and Schmidly 1994
Nine-banded Armadillo	10	90							Layne 2003
Reptiles									
Texas indigo Snake			100						Werler and Dixon, 2000

Table 30
Uncertainty Factors
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

Data	Uncertainty Factor to Approximate a NOAEL-based TRV	Uncertainty Factor to Approximate a LOAEL-based TRV
Chronic NOAEL	1	Not Applicable
Chronic LOAEL	5	1
Subchronic NOAEL	10	Not Applicable
Subchronic LOAEL	20	4
Acute NOAEL	30	Not Applicable
Acute LOAEL	50	10
LD50	100	20

USACHPPM, 2000

NOAEL - No observed adverse effects level

LOAEL - Lowest observed adverse effects level

TRV - Toxicity reference value

Table 31
South Pit Soils - Summary of NOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk	American Robin	Mourning Dove	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake	Retained or Eliminated
Barium	2.8E-01	1.4E+00	1.7E+00	4.6E-01	3.5E-01	8.3E-02	5.2E-01	8.0E-01	5.0E-01	6.7E+00	Retained
Cadmium	1.5E-01	2.8E+00	3.9E-01	5.4E+00	4.0E-01	2.1E-01	1.0E+01	1.4E+00	3.6E+00	1.7E-01	Retained
Chromium	4.4E-01	2.1E+00	1.1E+00	2.0E+00	5.8E-01	3.6E-01	3.9E+00	9.2E-01	2.0E+00	5.0E-01	Retained
Copper	4.0E-01	1.4E+00	6.8E-01	9.0E-01	2.5E-01	2.2E-01	1.5E+00	6.7E-01	8.4E-01	4.6E-01	Retained
Lead	1.0E+00	4.9E+00	7.4E+00	1.4E+00	1.3E+00	2.6E-01	9.1E-01	2.1E+00	8.7E-01	9.4E-01	Retained
Manganese	8.6E-03	4.8E-02	5.9E-02	1.2E-01	1.0E-01	2.4E-02	1.7E-01	1.2E-01	1.2E-01	8.8E-03	Eliminated; All NOAEL HQs < 1
Nickel	1.7E-02	1.7E-01	2.8E-02	6.4E-01	5.1E-02	4.9E-02	1.3E+00	2.7E-01	7.2E-01	1.9E-02	Retained
Selenium	1.9E-01	7.4E-01	5.5E-01	1.4E+00	6.0E-01	2.8E-01	1.8E+00	1.6E+00	8.3E-01	2.1E-01	Retained
Silver	6.7E-04	4.7E-02	4.2E-03	1.5E-02	6.8E-04	1.8E-04	3.0E-02	2.0E-03	1.2E-02	6.4E-04	Eliminated; All NOAEL HQs < 1
Vanadium	4.9E-02	2.2E-01	2.5E-01	3.7E-02	3.3E-02	1.0E-02	9.5E-02	5.3E-02	8.4E-02	5.5E-02	Eliminated; All NOAEL HQs < 1
Zinc	1.4E+00	1.1E+01	2.3E+00	9.2E+00	1.1E+00	9.2E-01	1.7E+01	1.0E+00	5.8E+00	1.6E+00	Retained
Mercury	2.1E-02	7.7E-01	4.0E-01	8.8E-01	2.5E-01	1.8E-02	1.3E+00	3.5E+00	9.7E-01	2.4E-02	Retained
4,4'-DDD	5.1E-02	1.2E-01	1.6E-02	1.8E-01	1.3E-02	5.9E-02	3.5E-01	1.2E-02	1.2E-01	5.9E-02	Eliminated; All NOAEL HQs < 1
4,4'-DDE	1.7E-02	1.0E-01	2.8E-03	1.6E-01	2.1E-03	2.0E-02	3.2E-01	--	1.1E-01	2.0E-02	Eliminated; All NOAEL HQs < 1
4,4'-DDT	1.3E+01	3.0E+01	2.6E+01	4.9E+01	3.9E+01	2.5E+01	4.9E+01	3.5E+01	2.8E+01	2.1E-02	Retained
Hazard Index: DDT, DDE and DDD	1.3E+01	3.0E+01	2.6E+01	4.9E+01	3.9E+01	2.5E+01	4.9E+01	3.5E+01	2.8E+01	9.9E-02	HI analysis eliminated; contribution of 4,4'-DDD and 4,4'-DDE to HI is negligible
alpha-Chlordane	5.6E-04	1.3E-02	2.0E-04	1.4E-02	1.1E-04	4.5E-04	2.8E-02	2.4E-03	1.1E-02	6.5E-04	Eliminated; All NOAEL HQs < 1
beta-BHC	4.9E-03	1.7E-03	6.7E-04	1.4E-03	3.0E-04	3.7E-03	3.0E-03	1.0E-04	1.3E-03	5.7E-03	Eliminated; All NOAEL HQs < 1
Dieldrin	2.0E-01	9.8E-01	4.7E-02	4.6E+00	1.2E-01	7.2E-01	9.0E+00	6.2E-02	3.0E+00	2.3E-01	Eliminated, detected in 3 of 55 samples (5%) in the 0-2 foot data set
Endrin	6.0E-02	5.6E-01	2.6E-03	8.9E-01	1.9E-03	7.2E-02	1.8E+00	3.9E-03	6.0E-01	7.0E-02	Eliminated, detected in 2 of 55 samples (4%) in the 0-2 foot data set
Endrin aldehyde	8.3E-02	3.8E-01	9.1E-02	5.9E-01	7.8E-02	9.8E-02	1.0E+00	2.6E-02	3.6E-01	9.5E-02	Eliminated; All NOAEL HQs < 1
gamma-BHC (Lindane)	2.8E-04	7.0E-04	3.8E-05	5.5E-04	1.4E-05	1.7E-04	1.1E-03	--	3.8E-04	3.2E-04	Eliminated; All NOAEL HQs < 1
gamma-chlordane	8.4E-03	2.0E-01	3.0E-03	1.8E-01	1.4E-03	5.6E-03	3.6E-01	2.4E-03	1.2E-01	9.7E-03	Eliminated; All NOAEL HQs < 1
Heptachlor	--	--	--	--	--	--	1.4E-01	3.6E-01	--	--	Eliminated; All NOAEL HQs < 1
Heptachlor epoxide	8.6E-04	9.3E-03	3.1E-03	6.3E-02	1.1E-02	4.3E-03	1.0E-01	2.7E-01	4.6E-02	9.9E-04	Eliminated; All NOAEL HQs < 1
Total PCBs	1.2E-02	3.6E-02	2.9E-02	6.4E-02	3.0E-02	1.7E-02	9.1E-02	7.6E-02	6.1E-02	1.3E-02	Eliminated; All NOAEL HQs < 1
2,4-Dimethylphenol	--	--	--	--	--	--	--	2.6E-04	2.0E-04	No TRV	Eliminated; All NOAEL HQs < 1
Benzaldehyde	No TRV	No TRV	No TRV	3.9E-05	2.7E-05	6.8E-06	2.3E-05	5.5E-03	2.4E-04	No TRV	Eliminated; All NOAEL HQs < 1
Carbazole	2.1E-08	1.2E-05	1.7E-05	3.0E-04	2.4E-04	4.1E-07	9.7E-05	6.7E-03	1.1E-04	4.5E-07	Eliminated; All NOAEL HQs < 1
Dibenzofuran	6.3E-03	3.7E-02	1.2E-02	6.3E-03	1.1E-03	8.0E-04	1.0E-02	3.5E-03	3.7E-03	7.3E-03	Eliminated; All NOAEL HQs < 1
High Molecular Weight PAHs	8.8E-04	8.3E-02	2.8E-02	2.6E-01	4.8E-02	2.1E-03	4.4E-01	1.6E+00	5.7E-01	9.8E-04	Retained
Cyanide	4.3E-02	4.1E-01	2.9E-01	3.4E-03	1.4E-03	3.0E-04	5.3E-03	5.7E-04	2.4E-03	4.9E-02	Eliminated; All NOAEL HQs < 1

-- indicates that the COPC was not detected at the soil depth evaluated for the receptor.

NOAEL HQ - No observed adverse effects level hazard quotient. Maximum detected concentration is the exposure point concentration.

Bold indicates HQ exceeds 1 and COPC is retained.

Table 32
North Pit Soils - Summary of NOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk	American Robin	Mourning Dove	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake	Retained or Eliminated
Arsenic	7.4E-03	1.0E-01	6.3E-02	1.8E-01	6.5E-02	1.2E-02	3.5E-01	2.9E-01	3.7E-01	7.9E-03	Eliminated; All NOAELs < 1
Barium	2.8E+00	1.4E+01	1.7E+01	4.6E+00	3.5E+00	8.2E-01	5.2E+00	1.0E+00	3.2E+00	3.2E+00	Retained
Cadmium	3.4E-01	6.3E+00	8.8E-01	1.2E+01	8.9E-01	4.8E-01	2.2E+01	4.6E+00	8.2E+00	3.9E-01	Retained
Chromium	1.5E-01	7.5E-01	3.8E-01	7.1E-01	2.0E-01	1.2E-01	1.4E+00	5.7E-02	6.1E-01	1.7E-01	Retained
Copper	1.3E-01	4.5E-01	2.3E-01	3.0E-01	8.2E-02	7.1E-02	5.1E-01	1.4E+00	9.1E-01	1.5E-01	Retained
Lead	6.5E+00	3.2E+01	4.8E+01	9.4E+00	8.7E+00	1.7E+00	5.9E+00	5.0E+00	4.7E+00	6.1E+00	Retained
Manganese	6.9E-03	3.8E-02	4.6E-02	9.8E-02	8.3E-02	1.9E-02	1.4E-01	1.5E-01	1.3E-01	6.8E-03	Eliminated; All NOAELs < 1
Nickel	1.9E-02	1.9E-01	3.1E-02	7.2E-01	5.8E-02	5.6E-02	1.4E+00	4.8E-02	5.4E-01	2.2E-02	Retained
Selenium	1.3E+00	5.2E+00	3.9E+00	1.0E+01	4.2E+00	2.0E+00	1.3E+01	5.4E+00	5.0E+00	1.5E+00	Retained
Silver	6.2E-04	4.9E-02	4.2E-03	1.6E-02	6.6E-04	1.5E-04	3.2E-02	1.2E-02	2.5E-02	6.7E-04	Eliminated; All NOAELs < 1
Vanadium	6.1E-02	2.8E-01	3.1E-01	4.6E-02	4.0E-02	1.3E-02	1.2E-01	4.9E-02	8.1E-02	6.9E-02	Eliminated; All NOAELs < 1
Zinc	1.3E+00	9.6E+00	2.1E+00	8.2E+00	9.5E-01	8.3E-01	1.5E+01	6.4E+00	6.6E+00	1.5E+00	Retained
Mercury	9.5E-02	3.5E+00	1.8E+00	4.0E+00	1.1E+00	8.3E-02	5.9E+00	8.9E+00	3.3E+00	1.1E-01	Retained
4,4'-DDD	2.1E-02	5.0E-02	6.5E-03	7.5E-02	5.2E-03	2.4E-02	1.4E-01	--	5.0E-02	2.4E-02	Eliminated; All NOAELs < 1
4,4'-DDT	5.2E-03	3.2E-02	8.6E-04	4.9E-02	6.7E-04	6.1E-03	9.6E-02	2.6E-04	3.3E-02	6.0E-03	Eliminated; All NOAELs < 1
Hazard Index: DDT and DDD	2.6E-02	8.1E-02	7.4E-03	1.2E-01	5.8E-03	3.0E-02	2.4E-01	2.6E-04	8.3E-02	3.0E-02	Eliminated; All NOAELs < 1
Aldrin	4.6E-01	2.4E+00	1.3E-02	1.1E+01	3.2E-02	1.6E+00	2.2E+01	--	7.4E+00	5.3E-01	Eliminated, detected in 1 of 54 samples (2%) in the 0-2 foot data set
beta-BHC	5.2E-05	2.0E-05	8.8E-06	1.7E-05	5.0E-06	3.9E-05	3.4E-05	2.1E-05	3.7E-05	5.9E-05	Eliminated; All NOAELs < 1
Endrin	1.7E-01	1.6E+00	7.1E-03	2.5E+00	5.2E-03	2.0E-01	4.9E+00	--	1.6E+00	1.9E-01	Eliminated, detected in 2 of 54 samples (4%) in the 0-2 foot data set
Endrin aldehyde	1.7E-02	7.5E-02	1.8E-02	1.2E-01	1.6E-02	2.0E-02	2.1E-01	--	7.2E-02	1.9E-02	Eliminated; All NOAELs < 1
Total PCBs	1.1E-03	3.3E-03	2.6E-03	5.8E-03	2.8E-03	1.6E-03	8.2E-03	3.7E-03	4.0E-03	1.2E-03	Eliminated; All NOAELs < 1
Bis(2-ethylhexyl)phthalate	1.8E+00	1.4E+01	4.8E+00	1.1E-01	1.9E-02	1.0E-02	2.0E-01	1.7E-05	7.8E-02	2.1E+00	Retained; data skewed by 84 mg/kg detection at NPSS01
High Molecular Weight PAHs	2.1E-03	2.0E-01	1.5E-02	6.4E-01	1.2E-01	5.1E-03	1.1E+00	1.6E-01	4.0E-01	2.4E-03	Retained
Pentachlorophenol	--	--	--	--	--	--	--	1.2E-03	2.4E-05	--	Eliminated; All NOAELs < 1
Cyanide	2.1E-01	2.0E+00	1.4E+00	1.7E-02	6.8E-03	1.5E-03	2.6E-02	5.6E-04	1.2E-02	2.4E-01	Retained

-- indicates that the COPC was not detected at the soil depth evaluated for the receptor.

NOAEL HQ - No observed adverse effects level hazard quotient. Maximum detected concentration is the exposure point concentration.

Bold indicates HQ exceeds 1 and COPC retained.

Table 33
East Ditch (South Segment) Riparian Soils - Summary of NOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk	American Robin	Mourning Dove	Red-Winged Blackbird	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake	Retained or Eliminated
Barium	1.1E-01	5.6E-01	6.8E-01	6.3E-01	1.8E-01	1.4E-01	3.3E-02	2.1E-01	4.7E-01	2.7E-01	2.7E+00	Retained
Cadmium	4.6E-03	8.7E-02	1.2E-02	6.5E-02	1.6E-01	1.2E-02	6.6E-03	3.1E-01	3.2E-02	1.1E-01	1.1E-01	Eliminated; All NOAELs < 1
Chromium	1.4E-02	7.1E-02	3.6E-02	5.1E-02	6.7E-02	1.9E-02	1.2E-02	1.3E-01	2.9E-02	6.3E-02	3.5E-01	Eliminated; All NOAELs < 1
Copper	2.3E-02	7.9E-02	4.0E-02	6.6E-02	5.2E-02	1.4E-02	1.2E-02	8.9E-02	3.9E-02	4.9E-02	5.6E-01	Eliminated; All NOAELs < 1
Lead	3.8E-02	1.9E-01	2.8E-01	2.5E-01	5.5E-02	5.1E-02	9.8E-03	3.4E-02	5.0E-01	1.7E-01	9.2E-01	Eliminated; All NOAELs < 1
Manganese	4.4E-03	2.3E-02	2.8E-02	2.3E-02	6.0E-02	5.1E-02	1.3E-02	8.3E-02	7.8E-02	6.9E-02	8.3E-02	Eliminated; All NOAELs < 1
Nickel	6.8E-03	6.9E-02	1.1E-02	4.6E-02	2.6E-01	2.1E-02	2.0E-02	5.2E-01	3.2E-02	2.0E-01	1.6E-01	Eliminated; All NOAELs < 1
Selenium	1.3E-01	5.2E-01	3.8E-01	5.6E-01	1.0E+00	4.2E-01	2.0E-01	1.2E+00	6.0E-01	5.1E-01	3.2E+00	Retained
Zinc	1.4E-02	1.0E-01	2.2E-02	8.0E-02	8.8E-02	1.0E-02	8.9E-03	1.6E-01	3.4E-02	6.1E-02	3.3E-01	Eliminated; All NOAELs < 1
Mercury	1.5E-04	5.2E-03	2.7E-03	5.0E-03	6.0E-03	1.7E-03	1.4E-04	8.7E-03	3.8E-03	3.5E-03	3.4E-03	Eliminated; All NOAELs < 1
4,4'-DDT	1.5E-03	9.2E-03	2.7E-04	6.2E-03	1.4E-02	2.2E-04	1.8E-03	2.8E-02	7.9E-05	9.5E-03	3.7E-02	Eliminated; All NOAELs < 1
Cyanide	2.8E-02	2.7E-01	1.9E-01	2.4E-01	2.2E-03	9.1E-04	2.0E-04	3.5E-03	2.9E-04	1.6E-03	6.7E-01	Eliminated; All NOAELs < 1

NOAEL HQ - No observed adverse effects level hazard quotient. Maximum detected concentration is the exposure point concentration.

Bold indicates HQ exceeds 1

Table 34
East Ditch (South Segment) Sediment as Soils - Summary of NOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk	American Robin	Mourning Dove	Red-Winged Blackbird	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Nine-Banded Armadillo	Texas Indigo Snake	Retained or Eliminated
Barium	6.3E-01	3.2E+00	3.9E+00	3.6E+00	1.1E+00	8.0E-01	1.9E-01	1.2E+00	7.3E-01	7.7E+00	Retained
Cadmium	7.1E-02	1.3E+00	1.9E-01	1.0E+00	2.5E+00	1.9E-01	1.0E-01	4.7E+00	1.6E+00	1.7E+00	Retained
Chromium	2.9E-02	1.4E-01	7.3E-02	1.0E-01	1.4E-01	3.9E-02	2.4E-02	2.6E-01	1.2E-01	7.1E-01	Eliminated; All NOAELs < 1
Copper	8.2E-02	2.8E-01	1.4E-01	2.3E-01	1.9E-01	5.1E-02	4.4E-02	3.2E-01	1.3E-01	2.0E+00	Retained
Lead	2.8E-01	1.4E+00	2.1E+00	1.9E+00	4.0E-01	3.7E-01	7.1E-02	2.5E-01	2.0E-01	5.5E+00	Retained
Manganese	9.0E-03	5.3E-02	6.6E-02	5.1E-02	1.3E-01	1.1E-01	2.3E-02	1.9E-01	1.3E-01	2.1E-01	Eliminated; All NOAELs < 1
Mercury	2.7E-03	9.7E-02	5.0E-02	9.3E-02	1.1E-01	3.2E-02	2.3E-03	1.6E-01	6.1E-02	6.4E-02	Eliminated; All NOAELs < 1
Nickel	1.0E-02	1.1E-01	1.7E-02	7.1E-02	4.0E-01	3.2E-02	3.1E-02	8.0E-01	3.0E-01	2.5E-01	Eliminated; All NOAELs < 1
Selenium	8.3E-02	3.3E-01	2.4E-01	3.6E-01	6.4E-01	2.7E-01	1.3E-01	7.9E-01	3.1E-01	2.0E+00	Retained
Silver	2.2E-04	1.6E-02	1.4E-03	1.1E-02	5.3E-03	2.3E-04	5.7E-05	1.1E-02	3.7E-03	4.7E-03	Eliminated; All NOAELs < 1
Vanadium	4.8E-02	2.2E-01	2.4E-01	1.2E-01	3.6E-02	3.2E-02	1.0E-02	9.2E-02	6.3E-02	1.1E+00	Retained
Zinc	2.8E-01	2.2E+00	4.6E-01	1.7E+00	1.8E+00	2.1E-01	1.9E-01	3.3E+00	1.2E+00	6.9E+00	Retained
4,4'-DDT	1.3E-02	7.6E-02	2.0E-03	5.1E-02	1.2E-01	1.5E-03	1.4E-02	2.3E-01	7.8E-02	3.1E-01	Eliminated; All NOAELs < 1
beta-BHC	8.5E-04	2.9E-04	1.2E-04	1.8E-04	2.4E-04	5.2E-05	6.4E-04	5.2E-04	2.3E-04	2.1E-02	Eliminated; All NOAELs < 1
gamma-Chlordane	1.1E-03	2.7E-02	4.0E-04	1.8E-02	2.4E-02	1.8E-04	7.4E-04	4.7E-02	1.6E-02	2.7E-02	Eliminated; All NOAELs < 1
High Molecular Weight PAHs	1.4E-03	1.3E-01	4.3E-02	1.1E-01	4.1E-01	7.4E-02	3.2E-03	6.9E-01	2.5E-01	3.2E-02	Eliminated; All NOAELs < 1

NOAEL HQ - No observed adverse effects level hazard quotient. Maximum detected concentration is the exposure point concentration.

Bold indicates HQ exceeds 1 and COPC is retained.

Table 35
East Ditch (South Segment) Sediment- Summary of Wildlife HQs and Community Risk
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Snowy Egret NOAEL-HQ EPC = Max	Raccoon NOAEL-HQ EPC = Max	Snowy Egret NOAEL-HQ EPC = 95% UCL	Raccoon NOAEL-HQ EPC = 95% UCL	Raccoon LOAEL-HQ EPC = 95% UCL	Benthic Invertebrate COPC (Sediment)?	Water Column (Surface Water) COPC?	Water Column (Groundwater) COPC?	Final East Ditch (South Segment) COPC
Aluminum	--	--	--	--	--	--	HQ = 7	--	No; October 2017 concentrations below criteria, see text
Antimony	No TRV	1.1E-03	--	--	--	HQ < 1	--	--	No; HQs < 1
Barium	9.1E+00	5.2E+00	4.6E+00	2.6E+00	1.6E+00	No, No PCL	--	--	No; HQs < 1, See EMF HQs for wildlife
Barium with EMF	--	--	1.3E-01	1.0E-03	6.6E-04	--	--	--	No; HQ < 1 and no benthic PCL
Beryllium	No TRV	1.3E-02	--	--	--	No, No PCL	--	--	No; HQ < 1 and no benthic PCL
Cadmium	9.3E-02	1.1E-01	--	--	--	HQ < 1	--	HQ < 1	No; HQs < 1
Copper	2.2E-01	1.2E-01	--	--	--	HQ < 1	--	HQ = 1.8	No groundwater to surface water pathway, see text
Lead	9.3E-01	1.7E-01	--	--	--	HQ < 1	--	HQ < 1	No; HQs < 1
Manganese	3.5E-02	1.3E-01	--	--	--	HQ < 1	--	--	No; HQs < 1
Nickel	2.5E-02	5.7E-02	--	--	--	HQ < 1	--	HQ < 1	No; HQs < 1
Selenium	1.0E+00	9.9E-01	--	--	--	No, No PCL	--	HQ < 1	No; HQ<1 and no benthic PCL
Thallium	No TRV	6.7E-01	--	--	--	No, No PCL	--	--	No; HQ<1 and no benthic PCL
Vanadium	2.7E-01	8.9E-02	--	--	--	No, No PCL	--	HQ < 1	No; HQ<1 and no benthic PCL
Zinc	2.4E-01	2.5E-01	--	--	--	HQ < 1	--	--	No; HQs < 1
Mercury	1.2E-01	8.7E-02	--	--	--	HQ < 1	--	HQ < 1	No; HQs < 1
4,4'-DDD	--	--	--	--	--	--	HQ < 1	--	No; HQs < 1
4,4'-DDE	--	--	--	--	--	--	HQ < 1	--	No; HQs < 1
4,4'-DDT	7.0E-01	3.8E-01	--	--	--	HQ < 1	HQ < 1	--	No; HQs < 1
Dieldrin	--	--	--	--	--	--	--	HQ = 20	No groundwater to surface water pathway, see text
beta-BHC	1.6E-02	7.8E-03	--	--	--	HQ < 1	--	--	No; HQs < 1
gamma-BHC	--	--	--	--	--	--	--	HQ = 1.9	No groundwater to surface water pathway, see text
gamma-Chlordane	2.1E-02	6.5E-03	--	--	--	HQ = 2.8	HQ < 1	--	No; wildlife and water column HQs < 1; only 1 of 9 detections in sediment; only detection under sediment cap
Heptachlor	--	--	--	--	--	--	HQ < 1	HQ = 4.8	No groundwater to surface water pathway, see text
Bis(2-ethylhexyl)phthalate	1.9E+00	5.7E-03	8.4E-01	--	--	HQ < 1	--	--	No; HQs < 1
1-Methylnaphthalene	--	--	--	--	--	--	--	HQ = 4.8	No groundwater to surface water pathway, see text
2,4-Dimethylphenol	--	--	--	--	--	--	--	HQ = 5.7	No groundwater to surface water pathway, see text
Benzo(a)pyrene	--	--	--	--	--	--	--	HQ = 9.2	No groundwater to surface water pathway, see text
Phenanthrene	--	--	--	--	--	--	--	HQ = 1.3	No groundwater to surface water pathway, see text
High Molecular Weight PAHs	4.0E-02	2.2E-01	--	--	--	As Total PAHs	--	As individual PAHs	No; HQs < 1
Low Molecular Weight PAHs	1.0E-05	3.4E-04	--	--	--	As Total PAHs	--	As individual PAHs	No; HQs < 1
Total PAHs	5.3E-02	2.7E-01	--	--	--	HQ < 1	HQ < 1	As individual PAHs	No; HQs < 1
Cyanide	3.4E-02	2.5E-04	--	--	--	No, No PCL	--	HQ = 2.1	No groundwater to surface water pathway, see text

See Table 5 for benthic invertebrate screening comparisons and Table 20 for benthic PCL comparisons.

See Table 3 for water column chronic screening comparisons. See Table 19 for acute comparisons.

See Table 9 for groundwater chronic screening comparisons. See Table 25 for acute comparisons.

Groundwater and surface water COPCs determined using acute criteria, South portion of ditch is intermittent.

-- The analyte is not a COPC for that media. Either not detected, or screened out (Tables 3, 5, or conservative HQ < 1).

NOAEL HQ - No observed adverse effects level hazard quotient

NOAEL-HQs for the snowy egret and raccoon used maximum detected concentration as EPC

LOAEL HQs - Lowest observed adverse effects level hazard quotient

EMF - exposure modifying factor

EPC - exposure point concentration

COPC - Chemical of potential concern

Exposure area = 0.6 acres. Home range of egret = 21 acres. Home range of raccoon = 1558 acres.

Bold indicates HQ exceeds 1 for at least 1 receptor or a PCL is not available

Table 36
East Ditch (North Segment) Sediment- Summary of Wildlife HQs and Community Risk
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Snowy Egret NOAEL-HQ EPC = Max	Raccoon NOAEL-HQ EPC = Max	Snowy Egret NOAEL-HQ EPC = 95% UCL	Raccoon NOAEL-HQ EPC = 95% UCL	Raccoon LOAEL-HQ EPC = 95% UCL	Benthic Invertebrates (Sediment)	Water Column (Surface Water)	Final East Ditch (North Segment) COPC
Aluminum	--	--	--	--	--	--	HQ = 21	No; October 2017 concentrations below criteria, see text
Arsenic	3.9E-01	4.3E-01	--	--	--	HQ < 1	--	No; HQs < 1
Barium	1.6E+01	9.1E+00	9.2E+00	5.2E+00	3.3E+00	HQ = 3.8	--	Yes; benthics only - see EMF HQs for wildlife
Barium with EMF	--	--	9.2E-01	7.3E-03	4.6E-03	--	--	
Beryllium	--	--	--	--	--	No, No PCL	--	No; HQ<1 and no benthic PCL
Cadmium	1.1E-01	1.3E-01	--	--	--	HQ < 1	--	No; HQs < 1
Cobalt	4.2E-02	3.3E-02	--	--	--	HQ < 1	HQ = 6.6	No; October 2017 concentrations below criteria, see text
Copper	9.2E-01	5.1E-01	--	--	--	HQ < 1	--	No; HQs < 1
Lead	2.7E+00	5.0E-01	7.9E-01	--	--	HQ < 1	--	No; HQs < 1
Manganese	1.6E-01	5.9E-01	--	--	--	HQ < 1	HQ = 27	No; see weight of evidence discussion
Mercury	2.7E-01	1.9E-01	--	--	--	HQ < 1	HQ < 1	No; HQs < 1
Nickel	2.8E-02	6.5E-02	--	--	--	HQ < 1	--	No; HQs < 1
Selenium	1.8E+00	1.8E+00	1.1E+00	1.1E+00	7.4E-01	HQ < 1	HQ < 1	
Selenium with EMF	--	--	1.1E-01	1.6E-03	1.0E-03	--	--	No; HQs < 1, see EMF HQs for wildlife
Thallium	--	--	--	--	--	No, No PCL	--	No; HQ<1 and no benthic PCL
Zinc	1.8E-01	1.9E-01	--	--	--	HQ < 1	--	No; HQs < 1
4,4'-DDT	--	--	--	--	--	--	HQ = 48	No; see weight of evidence discussion
alpha-Chlordane	--	--	--	--	--	--	HQ = 1.9	No; see weight of evidence discussion, < 5% FOD sediment
beta-BHC	--	--	--	--	--	--	HQ = 3.8	No; see weight of evidence discussion, < 5% FOD sediment
Bis(2-ethylhexyl)phthalate	5.2E+00	1.6E-02	1.4E+00	--	--	HQ < 1	--	No; HQs < 1, see EMF HQs for wildlife
Bis(2-ethylhexyl)phthalate with EMF	--	--	1.4E-01	--	--	--	--	
Carbazole	5.9E-05	1.8E-03	--	--	--	HQ = 0.6	--	No; HQs < 1
Cyanide	1.0E-01	7.6E-04	--	--	--	No, No PCL	--	No; HQ<1 and no benthic PCL
Endosulfan sulfate	7.0E+02	2.2E+00	7.0E+02	2.2E+00	1.1E+00	No, No PCL	--	No; off-site contributions and isolated occurrence, no benthic PCL, 2/22 detections in sediment
Endosulfan sulfate with EMF	--	--	7.0E+01	3.0E-03	1.5E-03	--	--	
Endrin aldehyde	--	--	--	--	--	--	HQ = 7	No; see weight of evidence discussion
Heptachlor	8.2E-02	7.4E-01	--	--	--	HQ = 14	HQ = 3.5	No; see weight of evidence discussion, 2/22 detections in sediment
Heptachlor epoxide	--	--	--	--	--	--	HQ = 4.4	No; see weight of evidence discussion
High Molecular Weight PAHs	9.8E-01	5.5E+00	--	1.6E+00	3.2E-01	HQ = 22	--	No; see Total PAHs for benthic and High Molecular Weight PAHs with EMF for wildlife
High Molecular Weight PAHs with EMF	--	--	--	2.2E-03	4.4E-04	--	--	No; HQs < 1
Low Molecular Weight PAHs	2.4E-04	8.2E-03	8.5E-05	--	--	HQ = 1.1	--	No; see Total PAHs for benthics
Methoxychlor	--	--	--	--	--	--	HQ = 1.9	No; see weight of evidence discussion
Total PAHs	1.7E+00	8.8E+00	5.1E-01	2.6E+00	5.2E-01	HQ < 1	--	
Total PAHs with EMF	--	--	--	3.6E-03	7.3E-04	HQ < 1	--	No, HQ< 1 See Total PAHs with EMF

See Table 8 for benthic invertebrate screening comparisons and Table 24 for benthic PCL comparisons.

See Tables 4 and 23 for water column chronic screening comparisons.

See Tables 10 and 26 for groundwater screening comparisons. There are no final groundwater COPCs.

Groundwater and surface water COPCs determined using chronic criteria, North portion of ditch is perennial.

-- The analyte is not a COPC for that media. Either not detected, or screened out (Tables 4, 8, 10 or conservative HQ < 1).

NOAEL HQ - No observed adverse effects level hazard quotient

NOAEL-HQs for the snowy egret and raccoon used maximum detected concentration as EPC

LOAEL HQs - Lowest observed adverse effects level hazard quotient

EMF - exposure modifying factor

EPC - exposure point concentration

COPC - Chemical of potential concern

PCL - Protective Concentration Level

FOD - frequency of detection

Exposure area = 0.6 acres. Home range of egret = 21 acres. Home range of raccoon = 1558 acres.

Bold indicates HQ exceeds 1 for at least 1 receptor or a PCL is not available

Table 37
South Pit Soils - Summary of NOAEL and LOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk			American Robin			Mourning Dove			White Footed Mouse			Eastern Cottontail			Coyote			Least Shrew			Texas Pocket Gopher			Nine-Banded Armadillo			Texas Indigo Snake		
	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ		
	NOAEL and LOAEL HQs using 95% UCL as EPC																													
Barium	1.4E-01	6.9E-02	< 1	7.0E-01	3.5E-01	< 1	8.4E-01	4.2E-01	< 1	2.3E-01	1.4E-01	< 1	1.7E-01	1.1E-01	< 1	4.1E-02	2.6E-02	< 1	2.5E-01	1.6E-01	< 1	4.2E-01	2.6E-01	< 1	2.1E-01	1.3E-01	< 1	1.6E-01		
Cadmium	6.6E-02	1.5E-02	< 1	1.2E+00	2.9E-01	4.7E-01	1.7E-01	4.0E-02	< 1	2.4E+00	2.4E-01	4.3E-01	1.8E-01	1.8E-02	< 1	9.4E-02	9.4E-03	< 1	4.4E+00	4.4E-01	7.9E-01	4.4E-01	4.4E-02	< 1	1.5E+00	1.5E-01	2.7E-01	7.6E-02		
Chromium	1.0E-01	1.7E-02	< 1	4.9E-01	8.4E-02	< 1	2.5E-01	4.3E-02	< 1	4.7E-01	1.9E-02	< 1	1.3E-01	5.5E-03	< 1	8.2E-02	3.4E-03	< 1	9.0E-01	3.7E-02	< 1	3.1E-01	1.3E-02	< 1	4.8E-01	2.0E-02	< 1	1.1E-01		
Copper	1.6E-01	5.2E-02	< 1	5.3E-01	1.8E-01	< 1	2.6E-01	8.9E-02	< 1	3.5E-01	2.1E-01	< 1	9.7E-02	5.8E-02	< 1	8.4E-02	5.0E-02	< 1	6.0E-01	3.6E-01	< 1	2.3E-01	1.4E-01	< 1	2.7E-01	1.6E-01	< 1	1.8E-01		
Lead	4.2E-01	2.1E-01	< 1	2.1E+00	1.0E+00	1.4E+00	3.1E+00	1.6E+00	2.1E+00	6.0E-01	3.2E-01	< 1	5.6E-01	3.0E-01	< 1	1.1E-01	5.7E-02	< 1	3.8E-01	2.0E-01	< 1	7.5E-01	3.9E-01	< 1	3.0E-01	1.6E-01	< 1	3.9E-01		
Nickel	9.7E-03	3.5E-03	< 1	9.8E-02	3.6E-02	< 1	1.6E-02	5.8E-03	< 1	3.7E-01	1.8E-01	< 1	3.0E-02	1.5E-02	< 1	2.9E-02	1.4E-02	< 1	7.4E-01	3.7E-01	< 1	8.0E-02	4.0E-02	< 1	3.0E-01	1.5E-01	< 1	1.1E-02		
Selenium	1.0E-01	5.0E-02	< 1	4.0E-01	2.0E-01	< 1	2.9E-01	1.5E-01	< 1	7.7E-01	5.1E-01	< 1	3.2E-01	2.1E-01	< 1	1.5E-01	1.0E-01	< 1	9.5E-01	6.3E-01	< 1	5.5E-01	3.7E-01	< 1	3.9E-01	2.6E-01	< 1	1.1E-01		
Zinc	4.9E-01	1.9E-01	< 1	3.7E+00	1.4E+00	2.1E+00	8.0E-01	3.1E-01	< 1	3.2E+00	8.1E-01	1.3E+00	3.7E-01	9.3E-02	< 1	3.2E-01	8.1E-02	< 1	5.8E+00	1.5E+00	2.3E+00	3.8E-01	9.7E-02	< 1	2.0E+00	5.1E-01	8.1E-01	5.7E-01		
Mercury	1.8E-02	9.0E-03	< 1	6.6E-01	3.3E-01	< 1	3.4E-01	1.7E-01	< 1	7.6E-01	1.5E-01	< 1	2.2E-01	4.3E-02	< 1	1.6E-02	3.2E-03	< 1	1.1E+00	2.2E-01	3.7E-01	6.8E-01	1.4E-01	< 1	4.4E-01	8.8E-02	< 1	2.1E-02		
4,4'-DDT	1.3E+01	1.3E+00	2.3E+00	3.0E+01	3.0E+00	5.5E+00	2.6E+01	2.6E+00	4.7E+00	4.9E+01	9.7E+00	1.6E+01	3.9E+01	7.8E+00	1.3E+01	2.5E+01	4.9E+01	8.2E+00	4.8E+01	9.7E+00	1.6E+01	3.5E+01	7.0E+00	1.2E+01	2.8E+01	5.6E+00	9.3E+00	5.3E-03		
High Molecular Weight PAHs	4.1E-04	4.1E-05	< 1	3.8E-02	3.8E-03	< 1	1.3E-02	1.3E-03	< 1	1.2E-01	2.4E-02	< 1	2.2E-02	4.3E-03	< 1	9.9E-04	2.0E-04	< 1	2.0E-01	4.0E-02	< 1	2.9E-01	5.9E-02	< 1	1.1E-01	2.2E-02	< 1	4.4E-04		

NOAEL and LOAEL HQs using 95% UCL as EPC and attenuation of dose using Area Use Factor as appropriate for each species																						
	Home range = 1722 acres South Soils EMF = 0.004			EMF not applicable Home range < exposure area		Home range = 40 acres South Soils EMF = 0.173			EMF not applicable Home range < exposure area		Home range = 7 acres South Soils EMF = 0.98. EMF not used		Home range = 5485 acres South Soils EMF = 0.0013			EMF not applicable Home range < exposure area		EMF not applicable Home range < exposure area		Home range = 8 acres South Soils EMF = 0.863		
Lead	NA	NA	NA	5.4E-01	2.7E-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
4,4-DDT	5.1E-02	5.1E-03	NA	4.5E+00	4.5E-01	8.1E-01	3.2E-02	6.4E-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4E+01	4.8E+00	8.0E+00		

South Pit Soils exposure area = 6.9 acres.

-- indicates that the COPC was not detected at the soil depth evaluated for the receptor.

NOAEL HQ - No observed adverse effects level hazard quotient

LOAEL HQ - Lowest observed adverse effects level hazard quotient

Average TRV HQ calculated by taking simple average of the NOAEL and LOAEL TRVs compared to the total daily dose.

NA = not applicable, both the NOAEL-based and LOAEL-based HQs are < 1.

Toxocara indigo snake is considered a special status species, only NOAEL applies.

Texas Indigo snake is considered a special status species, only NUAEI applies.

Bold indicates final COPC for this medium

Table 38
North Pit Soils - Summary of NOAEL and LOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Red-Tailed Hawk			American Robin			Mourning Dove			White Footed Mouse			Eastern Cottontail			Coyote			Least Shrew			Texas Pocket Gopher			Nine-Banded Armadillo			Texas Indigo Snake
	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ
NOAEL and LOAEL HQs using 95% UCL as EPC																												
Barium	4.1E-01	2.0E-01	< 1	2.1E+00	1.0E+00	1.4E+00	2.5E+00	1.3E+00	1.7E+00	6.7E-01	4.2E-01	< 1	5.1E-01	3.2E-01	< 1	1.2E-01	7.6E-02	< 1	7.5E-01	4.7E-01	< 1	3.0E-01	1.9E-01	< 1	4.8E-01	3.0E-01	< 1	4.6E-01
Cadmium	1.3E-01	3.1E-02	< 1	2.5E+00	5.8E-01	9.4E-01	3.5E-01	8.0E-02	< 1	4.7E+00	4.7E-01	8.6E-01	3.5E-01	3.5E-02	< 1	1.9E-01	1.9E-02	< 1	8.8E+00	8.8E-01	1.6E+00	1.6E+00	1.6E-01	2.9E-01	3.1E+00	3.1E-01	5.7E-01	1.5E-01
Chromium	6.8E-02	1.2E-02	< 1	3.4E-01	5.8E-02	< 1	1.7E-01	2.9E-02	< 1	3.2E-01	1.3E-02	< 1	9.1E-02	3.8E-03	< 1	5.6E-02	2.3E-03	< 1	6.2E-01	2.5E-02	< 1	3.0E-02	1.3E-03	< 1	2.5E-01	1.0E-02	< 1	7.8E-02
Copper	6.7E-02	2.2E-02	< 1	2.3E-01	7.6E-02	< 1	1.1E-01	3.8E-02	< 1	1.5E-01	9.0E-02	< 1	4.2E-02	2.5E-02	< 1	3.6E-02	2.2E-02	< 1	2.6E-01	1.5E-01	< 1	3.2E-01	1.9E-01	< 1	1.9E-01	1.1E-01	< 1	7.7E-02
Lead	6.6E-01	3.3E-01	< 1	3.3E+00	1.6E+00	2.2E+00	4.9E+00	2.4E+00	3.3E+00	9.5E-01	5.0E-01	< 1	8.8E-01	4.7E-01	< 1	1.7E-01	8.9E-02	< 1	6.0E-01	3.1E-01	< 1	1.4E+00	7.4E-01	9.7E-01	6.4E-01	3.4E-01	< 1	6.1E-01
Nickel	1.1E-02	3.8E-03	< 1	1.1E-01	3.9E-02	< 1	1.7E-02	6.3E-03	< 1	4.0E-01	2.0E-01	< 1	3.3E-02	1.6E-02	< 1	3.1E-02	1.6E-02	< 1	8.0E-01	4.0E-01	< 1	3.1E-02	1.5E-02	< 1	2.9E-01	1.5E-01	< 1	1.2E-02
Selenium	5.5E-01	2.8E-01	< 1	2.2E+00	1.1E+00	1.5E+00	1.6E+00	8.2E-01	1.1E+00	4.3E+00	2.8E+00	3.4E+00	1.8E+00	1.2E+00	1.4E+00	8.4E-01	5.6E-01	< 1	5.3E+00	3.5E+00	4.2E+00	1.6E+00	1.1E+00	1.3E+00	2.0E+00	1.3E+00	1.6E+00	6.4E-01
Zinc	4.3E-01	1.6E-01	< 1	3.3E+00	1.3E+00	1.8E+00	6.9E-01	2.7E-01	< 1	2.8E+00	7.1E-01	1.1E+00	3.2E-01	8.1E-02	< 1	2.8E-01	7.1E-02	< 1	5.0E+00	1.3E+00	2.0E+00	1.5E+00	3.7E-01	5.9E-01	1.8E+00	4.6E-01	7.3E-01	4.9E-01
Mercury	2.4E-02	1.2E-02	< 1	8.8E-01	4.4E-01	< 1	4.6E-01	2.3E-01	< 1	1.0E+00	2.0E-01	3.4E-01	2.9E-01	5.8E-02	< 1	2.1E-02	4.2E-03	< 1	1.5E+00	3.0E-01	4.9E-01	2.0E+00	4.0E-01	6.7E-01	1.0E+00	2.0E-01	3.4E-01	2.7E-02
Bis(2-ethylhexyl)phthalate	2.2E-01	8.7E-03	< 1	1.8E+00	7.1E-02	1.4E-01	5.9E-01	2.3E-02	< 1	1.3E-02	6.3E-03	< 1	2.3E-03	1.1E-03	< 1	1.3E-03	6.2E-04	< 1	2.4E-02	1.2E-02	< 1	6.1E-06	3.0E-06	< 1	9.2E-03	4.5E-03	< 1	2.5E-01
High Molecular Weight PAHs	1.1E-03	1.1E-04	< 1	1.1E-01	1.1E-02	< 1	7.6E-03	7.6E-04	< 1	3.3E-01	6.6E-02	< 1	5.7E-02	1.2E-02	< 1	2.7E-03	5.3E-04	< 1	5.6E-01	1.1E-01	< 1	3.9E-02	7.8E-03	< 1	2.0E-01	3.9E-02	< 1	1.2E-03
Cyanide	3.9E-02	7.8E-03	< 1	3.7E-01	7.3E-02	< 1	2.6E-01	5.2E-02	< 1	3.1E-03	3.1E-04	< 1	1.3E-03	1.3E-04	< 1	2.7E-04	2.7E-05	< 1	4.8E-03	4.8E-04	< 1	5.6E-04	5.6E-05	< 1	1.9E-03	1.9E-04	< 1	4.4E-02

NOAEL and LOAEL HQs using 95% UCL as EPC and attenuation of dose using Area Use Factor as appropriate for each species

Summary of Final NOAEL and LOAEL HQs

North Pit Soils exposure area = 4.7 acres

-- indicates that the COPC was not detected at the soil depth evaluated for the receptor.

NOAEL HQ - No observed adverse effects level hazard quotient

LOAEL HQ - Lowest observed adverse effects level hazard quotient

Average TRV HQ calculated by taking simple average of the NOAEL and LOAEL TRVs compared to the total daily dose.

NA - not applicable, both the NOAEL-based and LOAEL-based HQs are < 1.

Texas indigo snake is considered a special status species, only NOAEL applies.

Bold indicates final COPC for this medium.

Table 39
East Ditch (South Segment) Riparian Soil - Summary of NOAEL and LOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	Least Shrew			Texas Indigo Snake	
	NOAEL-HQ	LOAEL-HQ	Average TRV HQ	NOAEL-HQ	NOAEL-HQ with EMF
Barium	2.1E-01	1.3E-01	1.6E-01	2.7E+00	5.7E-03
Selenium	1.1E+00	7.2E-01	8.7E-01	2.8E+00	5.9E-03

HQs developed using maximum detected concentrations for exposure point concentration.

Texas indigo snake is considered a special status species, only NOAEL applies.

Table 40
East Ditch (South Segment) Sediment as Soil - Summary of NOAEL and LOAEL HQs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

COPC	American Robin			Mourning Dove			Red-Winged Blackbird			White Footed Mouse			Least Shrew			Nine-Banded Armadillo		Texas Indigo Snake	
	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	Avg TRV HQ	NOAEL-HQ	LOAEL-HQ	NOAEL-HQ with EMF	
	Barium	1.6E+00	8.1E-01	1.1E+00	2.0E+00	9.8E-01	1.3E+00	1.8E+00	9.0E-01	1.2E+00	5.3E-01	3.3E-01	NA	5.9E-01	3.7E-01	NA	3.6E-01	2.3E-01	7.7E+00
Cadmium	6.0E-01	1.4E-01	NA	8.3E-02	1.9E-02	NA	4.5E-01	1.0E-01	NA	1.1E+00	1.1E-01	2.1E-01	2.1E+00	2.1E-01	3.8E-01	7.2E-01	7.2E-02	7.7E-01	NA
Copper	1.6E-01	5.5E-02	NA	8.1E-02	2.7E-02	NA	1.4E-01	4.5E-02	NA	1.1E-01	6.4E-02	NA	1.8E-01	1.1E-01	NA	7.6E-02	4.5E-02	1.2E+00	3.5E-03
Lead	7.1E-01	3.6E-01	NA	1.1E+00	5.3E-01	7.1E-01	9.7E-01	4.8E-01	NA	2.1E-01	1.1E-01	NA	1.3E-01	6.9E-02	NA	1.0E-01	5.4E-02	2.8E+00	8.5E-03
Selenium	2.2E-01	1.1E-01	NA	1.7E-01	8.3E-02	NA	2.4E-01	1.2E-01	NA	4.3E-01	2.9E-01	NA	5.4E-01	3.6E-01	NA	2.1E-01	1.4E-01	1.4E+00	4.1E-03
Vanadium	1.6E-01	8.2E-02	NA	1.8E-01	9.1E-02	NA	9.5E-02	4.7E-02	NA	2.7E-02	1.4E-02	NA	7.0E-02	3.5E-02	NA	4.8E-02	2.4E-02	8.6E-01	NA
Zinc	9.6E-01	3.7E-01	NA	2.1E-01	7.9E-02	NA	7.4E-01	2.9E-01	NA	8.2E-01	2.1E-01	NA	1.5E+00	3.8E-01	6.0E-01	5.2E-01	1.3E-01	3.1E+00	9.2E-03

NOAEL HQ - No observed adverse effects level hazard quotient

LOAEL HQ - Lowest observed adverse effects level hazard quotient

Average TRV HQ calculated by taking simple average of the NOAEL and LOAEL TRVs compared to the total daily dose.

NA - not applicable, both the NOAEL-based and LOAEL-based HQs are < 1.

Texas indigo snake is considered a special status species, only NOAEL applies.

South ditch exposure area = 0.6 acres

Table 41
Available Background Data Sets for PAHs in Soil and Sediment (mg/kg)

STUDY	Stat.	Carcinogens							Non-Carcinogens							Calculated					
		Benz(a)anthracene	Benz(a)pyrene	Benz(b)fluoranthene	Benz(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Aceanthrene	Aceanthrylene	Anthracene	Benz(e)pyrene	Benz(g,h,i)perylene	Fluoranthene	Florene	2-Methylnaphthalene	Naphthalene	Phenanthrene			
SOIL																					
Bradley et al. 1994 ¹																					
Urban New England	Mean	1.319	1.323	1.435	1.681	1.841	0.388	0.987	0.477	--	0.688	--	1.621	2.848	0.483	--	0.365	1.835	2.392	1.97E+01	
Urban New England	Min.	0.048	0.04	0.049	0.043	0.038	0.02	0.093	0.024	0.018	0.029	--	0.024	0.11	0.022	--	0.018	0.071	0.082	7.29E-01	
Urban New England	Max.	15	13	12	25	21	2.9	6	0.34	1.1	5.7	--	8.1	39	3.3	--	0.66	36	11	2.00E+02	
ASTDR 1995 ²																					
Urban	Min.	0.169	0.165	15	0.3	0.251	--	8	--	--	--	0.06	0.9	0.2	--	--	--	--	0.145	2.52E+01	
Urban	Max.	59	0.22	62	26	0.64	--	61	--	--	--	14	47	166	--	--	--	--	--	147	5.83E+02
Agricultural	Min.	0.056	0.005	0.058	0.058	0.078	--	0.063	0.006	0.005	0.011	0.053	0.066	0.12	0.0097	--	--	0.048	0.099	7.36E-01	
Agricultural	Max.	0.11	0.9	0.22	0.25	0.12	--	0.1	0.006	0.005	0.013	0.13	0.066	0.21	0.0097	--	--	0.14	0.15	2.43E+00	
Rural	Min.	0.005	0.002	0.02	0.01	0.038	--	0.01	0.0017	--	--	0.01	0.0003	--	--	--	0.03	0.001	0.001	1.28E-01	
Rural	Max.	0.02	1.3	0.03	0.11	0.038	--	0.015	0.0017	--	--	0.07	0.04	--	--	--	0.03	0.0197	0.0197	1.67E+00	
Massachusetts DEP ⁴																					
Worcester	95% Percentile	3.8	3.3	--	--	3.6	--	2	--	--	1.2	--	1.41	11	--	--	--	5.6	9	4.09E+01	
Worcester	Min.	ND	ND	--	--	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	
Worcester	Max.	15	9.7	--	--	14	1.6	6	1.7	0.76	3.4	--	5.2	40	2	0.77	1.9	16	30	1.48E+02	
Watertown	95% Percentile	6.04	4.77	6.79	4.47	5.06	0.604	6.2	--	--	--	--	--	--	--	--	--	--	--	3.39E+01	
Watertown	Min.	0.021	0.6	0.6	0.065	0.016	0.155	1.2	--	--	--	--	--	--	--	--	--	--	--	2.66E+00	
Watertown	Max.	6.05	6.08	7.08	5.13	6.6	0.64	7.2	--	--	--	--	--	--	--	--	--	--	--	3.88E+01	
Roadway Project ⁷	95% Percentile	19	17	18	9.7	18	2.1	7	4.1	1.9	10	--	7.7	33	5.5	2.2	3	38	35	2.31E+02	
Roadway Project ³	Min.	0.045	0.031	0.045	0.045	0.022	0.045	0.022	0.024	0.037	0.033	--	0.045	0.035	0.028	0.03	0.016	0.029	0.034	5.66E-01	
Roadway Project ³	Max.	250	230	270	150	240	39	100	42	10	130	--	77	490	79	13	28	480	440	3.07E+03	
EPRI 2003 ⁵																					
Western New York	95% Percentile	2.25	2.77	2.37	1.76	2.49	0.818	2.17	0.231	0.514	0.592	--	2.1	4.97	0.254	0.36	0.443	2.82	4.09	3.10E+01	
Western New York	Min.	0.00844	0.00748	0.0053	0.00936	0.0116	0.00183	0.00503	0.00267	0.00318	0.00137	--	0.00728	0.0195	0.00191	0.00225	0.00801	0.00648	0.017	1.19E-01	
Western New York	Max.	3.91	4.74	3.34	3.35	4.33	0.819	2.33	0.26	0.713	1.33	--	2.42	9.01	0.0319	0.816	0.667	4.82	6.75	4.96E+01	
Kay et al. 2003 ⁶																					
Chicago	95% Percentile	9.14	10.3	11.2	7.86	8.78	1.1	7.12	1.097	0.441	2.54	--	6.311	19.93	1.394	--	0.412	11.97	11.97	1.12E+02	
Chicago	Mean	0.72	0.88	0.99	0.68	0.77	0.15	0.61	0.0628	0.024	0.164	--	0.488	1.79	0.07	--	0.033	0.854	1.261	9.55E+00	
Chicago	Min.	0.026	0.039	0.04	0.036	0.31	0.008	0.031	ND	ND	ND	--	0.024	0.052	ND	--	ND	0.022	0.051	6.39E-01	
Chicago	Max.	16	17	18	10	15	1.6	9.9	1.5	1.035	4.6	--	8.1	35	2	--	0.7	19	30	1.89E+02	
Illinois EPA ⁷																					
Chicago	95% Percentile	1.1	1.3	1.5	1	1.1	0.2	0.86	--	--	--	--	--	--	--	--	--	--	--	7.06E+00	
Within MSA	95% Percentile	1.8	2.1	2	1.7	2.7	0.42	1.6	--	--	--	--	--	--	--	--	--	--	--	1.23E+01	
Outside MSA	95% Percentile	0.72	0.98	0.7	0.63	1.1	0.15	0.51	--	--	--	--	--	--	--	--	--	--	--	4.79E+00	
California DTSC 2009 ⁸																					
Northern CA	Min.	0.00005	0.00095	0.00019	0.00006	2.5E-05	0.00024	2.5E-05	0.005	0.005	0.0033	--	0.047	0.005	0.005	--	0.005	0.005	0.005	2.25E-02	
Northern CA	Max.	0.17	2.08	0.217	0.64	0.038	0.578	0.17	27.6	17.3	16.6	--	0.053	2.7	2.59	--	11.1	5.84	4.6	4.66E+01	
AMEC (Maine) 2012 ⁹																					
Rural Developed Areas	90% UPL	0.86	1.5	1.3	0.69	1.0	0.32	0.40	0.10	0.32	0.29	--	0.57	2.0	0.22	0.16	0.11	0.83	2.0	1.27E+01	
Urban Developed Areas	90% UPL	1.6	1.7	1.9	0.76	2.2	0.28	0.74	0.20	0.39	0.40	--	0.79	3.2	0.29	0.089	0.22	1.6	2.8	1.92E+01	
Urban Fill	90% UPL	26.8	5.2	6.8	12.44	6.4	4.52	3.32	3.53	1.35	6.69	--	15.68	10.5	4.37	0.41	0.82	6.1	9.5	1.24E+02	
Indiana Terre Haute Study ¹⁰																					

" -- " = no value. ND = Not Determined.

*** = Maximum detected concentration. The maximum detected concentration was lower than the calculated 95% UCL.

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Notes:

1. MSA means Metropolitan Statistical Area - a core based statistical area associated with at least one urbanized area with a population of at least 50,000. Champaign County is included in the Illinois list of MSAs.
2. Data from the City of Chicago excluding O'Hare International Airport, areas with indication of historical industrial sources of PAHs, areas stained or with stressed vegetation, and areas completely paved over or with structures precluding soil sampling.
3. Data from along roads and sidewalks, and in parks and open lots from three New England cities: Boston, MA; Springfield, MA; and Providence, RI.
4. Data from along the Central Artery/Tunnel Project with samples selected based on evidence of visible contamination or elevated organic vapor monitoring readings thus introducing high bias but still indicative of ambient roadway concentrations
5. Data from areas adjacent to the Central Artery/Tunnel Project with samples selected based on evidence of visible contamination or elevated organic vapor monitoring readings, thus introducing a high bias, but also representative of typical roadways.
6. Data is a compilation of rural, agricultural, and urban soil derived from seven references cited in the document dating from 1973 to 1987.
7. The California DTSC has approved the data set as representative of background PAH concentrations.
8. Data is a compilation of 30 sites from western New York (Canandaigua and Rochester) including utility owned sites, parks, forested areas, roadside right-of-ways, fields, public and commercial properties

Table 42
Final COPCs
Screening Level Ecological Risk Assessment
Brine Service Company Superfund Site

South Pit Terrestrial		North Pit Terrestrial		Southern (Freshwater Intermittent) Portion of East Ditch								Northern (Marine Perennial)		Portion of Ditch	
Soil		Soil		Riparian Soil		Sediment as Soil		Surface Water	Groundwater	Freshwater Sediment		Surface Water	Groundwater	Marine Sediment	
Community	Wildlife	Community	Wildlife	Community	Wildlife	Community	Wildlife	Community	Community	Community	Wildlife	Community	Community	Community	Wildlife
Mercury	Lead	Barium	Barium	None	None	None (1)	None (2)	None	None	None	None	4,4'-DDT	None	Barium	None
Zinc	Zinc	Lead	Cadmium									alpha-Chlordane			
4,4'-DDT		Mercury	Lead									Heptachlor			
		Selenium	Selenium									Methoxychlor			
		Zinc	Zinc												

(1) - HQ for soil community < 10; same criteria as North and South Pit terrestrial soil

(2) - HQs are less than one for robin, dove and RWB using post-cap 95% UCLs; original table had none for wildlife sediment as soil

FIGURES

Figure 1 Site Location Map

Figure 2 Site Map

Figure 3 Screening Level Ecological Risk Process

Figure 4 Site Land Use

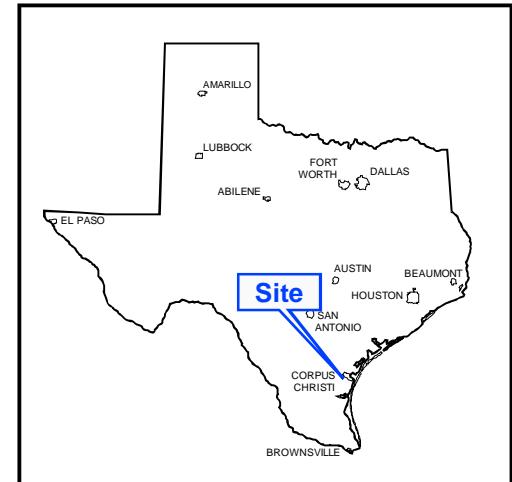
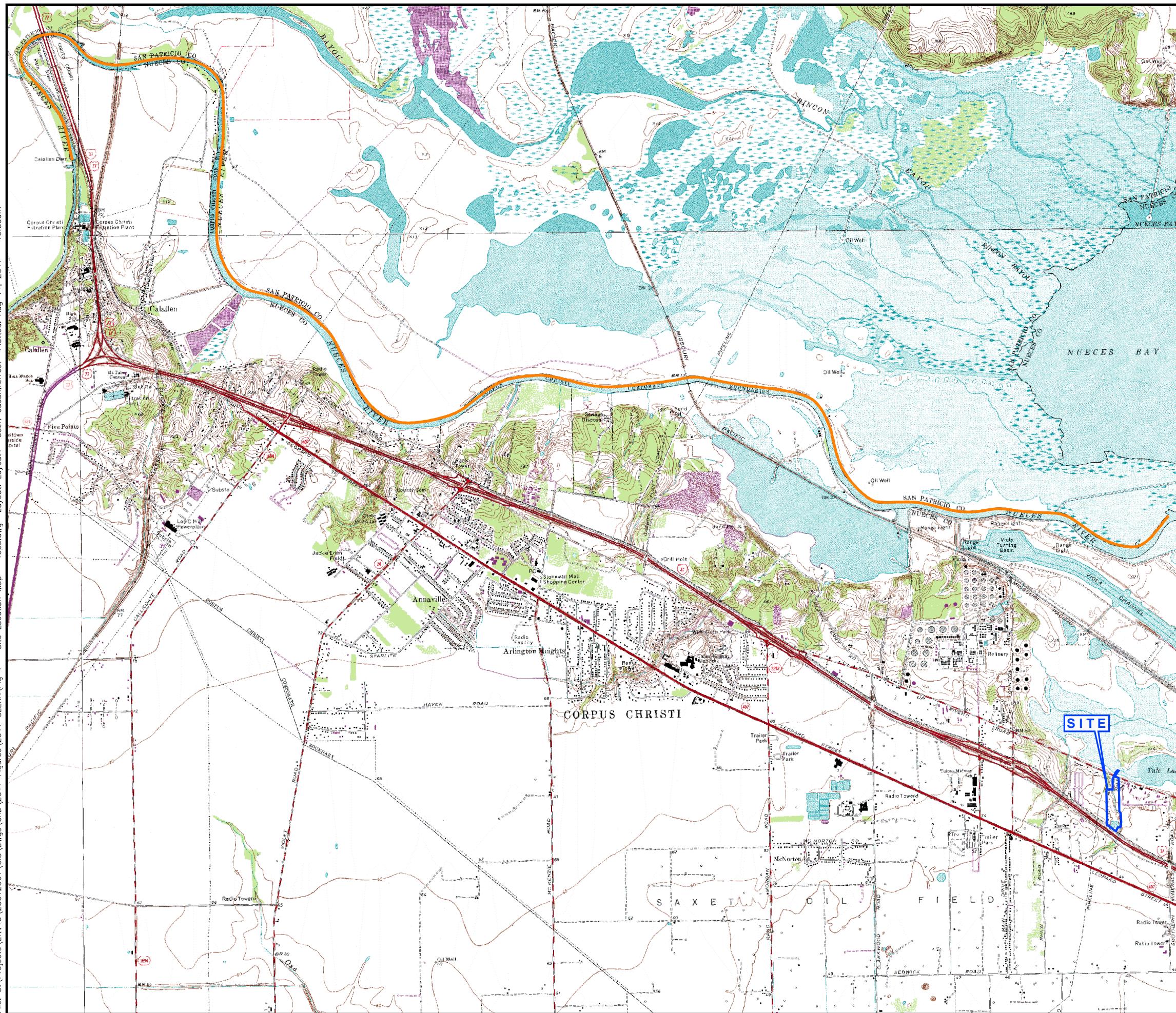
Figure 5 Terrestrial North and South Areas

Figure 6 Surface Water and Sediment Sample Locations

Figure 7 Ecological Conceptual Site Model

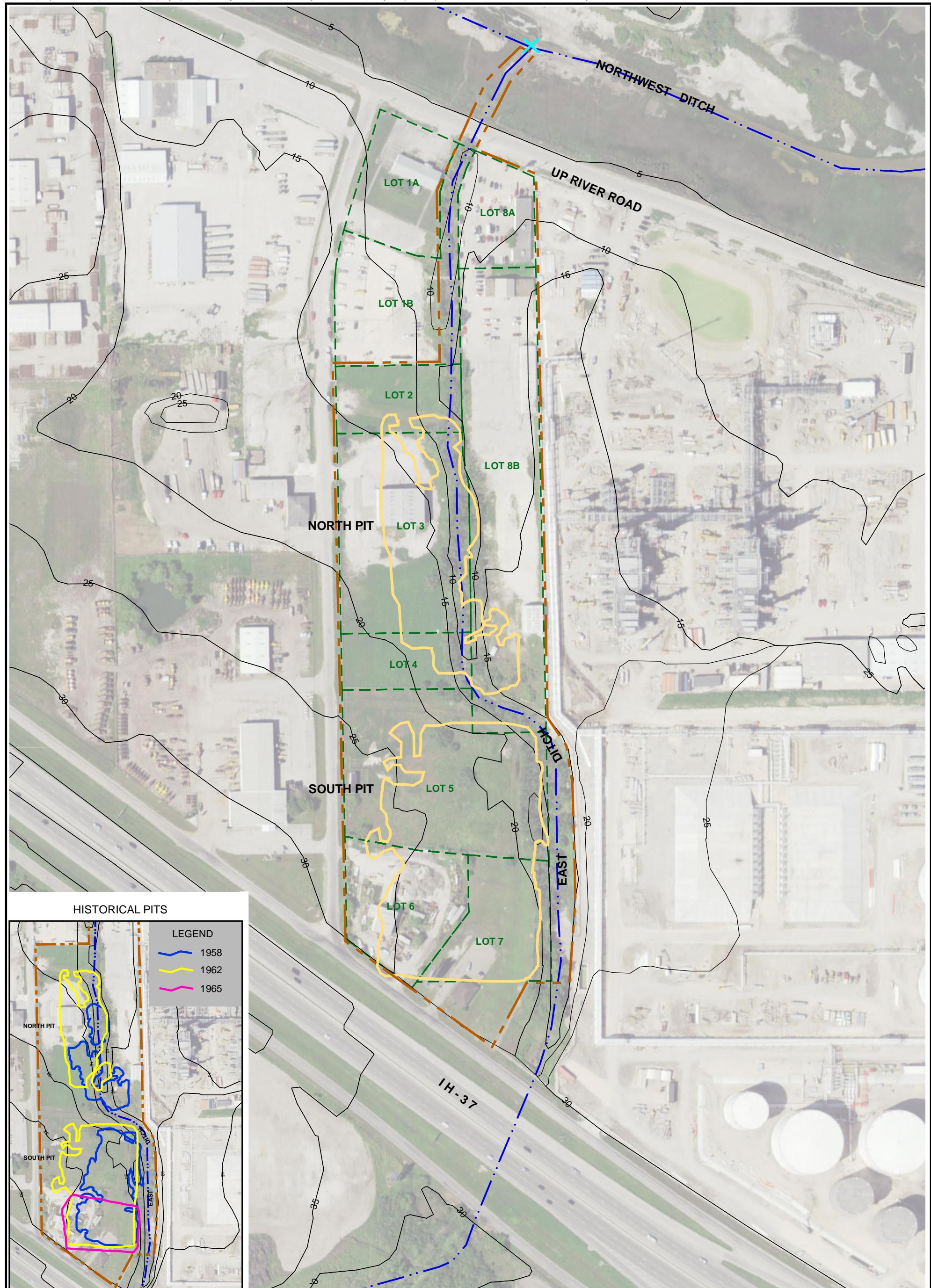
Figure 8 Barium, Lead, Selenium, Zinc and Mercury Concentrations in Soil (0 – 2' bgs)

Figure 9 Barium, Endosulfan Sulfate, and Total PAH Concentrations in East Ditch (North) and Up River Road



Source:
 U.S.G.S. 7.5-minute Series Topographic Quadrangle Maps from TNRIS
 for Annsville, Corpus Christi, Robstown, Edroy, and Odem Texas.
 Photorevised 1975.

AECOM		
19219 KATY FREEWAY, STE. 100 HOUSTON, TEXAS 77094 PH: 281-646-2400 FAX: 281-646-2401		
Site Location Map		
Project:	BRINE SERVICE COMPANY SUPERFUND SITE	
Client:	Brine Service Cooperating Parties	
Scale:	As Shown	Drawn by: SJF
		Date: 7-17-17
Project No.:	60399892	File Name: Site Location Map.dwg
		Figure: 1



LEGEND:

- TOPOGRAPHIC CONTOUR INTERVAL
- SITE BOUNDARY
- LOT BOUNDARY
- EXTENT OF HISTORICAL PITS
- DOWNSTREAM AOC LIMIT OF INVESTIGATION

Source:

2015 TOP Aerial Image from TNRIS - 0.5m Resolution

Topographic Elevation Contours from the U.S.G.S.
7.5-minute Series Topographic Quadrangle Maps for
Annsville and Corpus Christi, Texas, 1975.

0 200 400
APPROXIMATE SCALE IN FEET



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HOUSTON, TEXAS 77094
PH: 281-646-2400
FAX: 281-646-2401

Title:

Site Map

Project:

BRINE SERVICE COMPANY
SUPERFUND SITE

Client: Brine Service Cooperating Parties

Scale:

As
Shown

Drawn by:
SJF

Date:
7-12-17

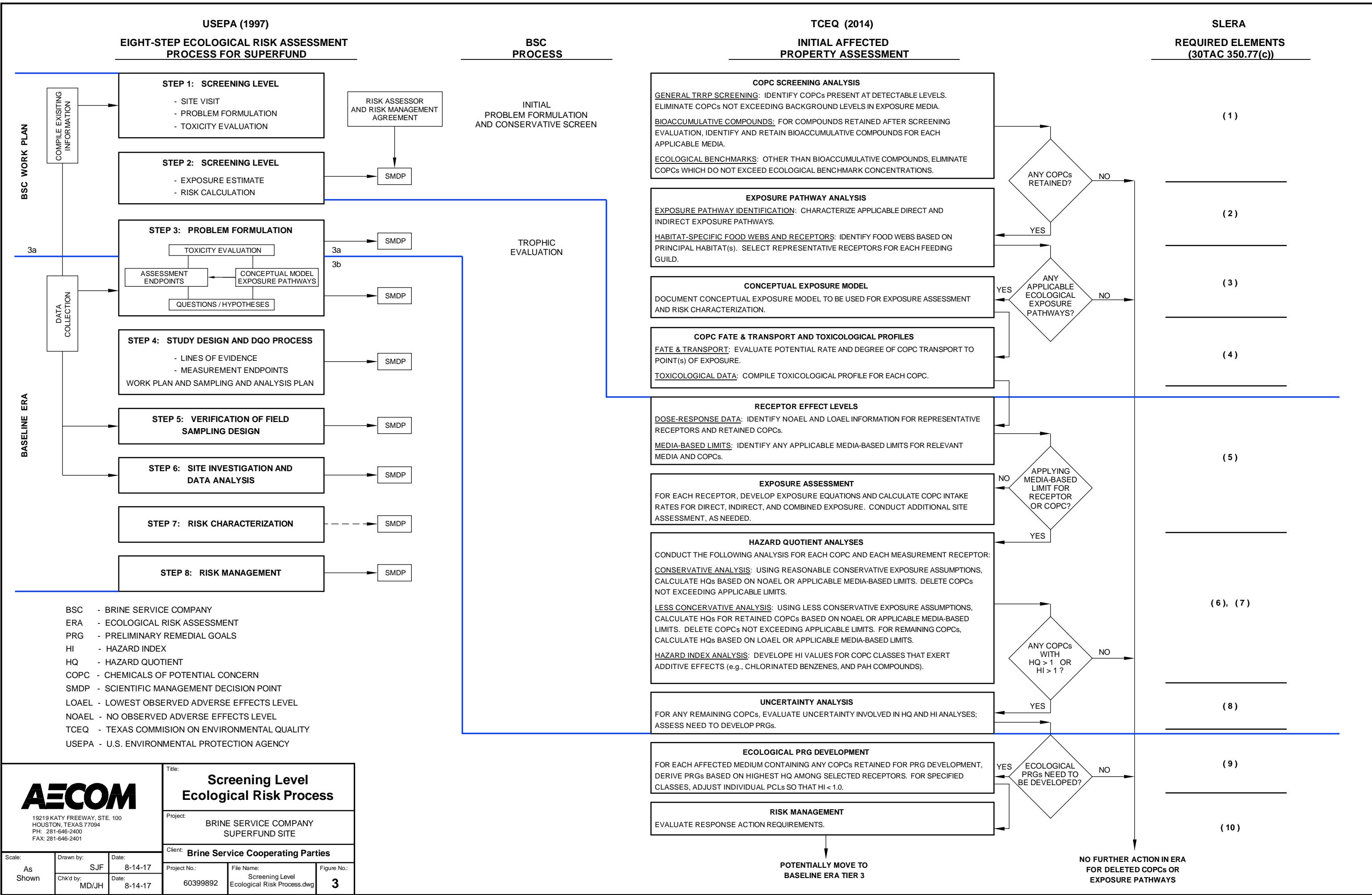
Chkd by:
MD/JH

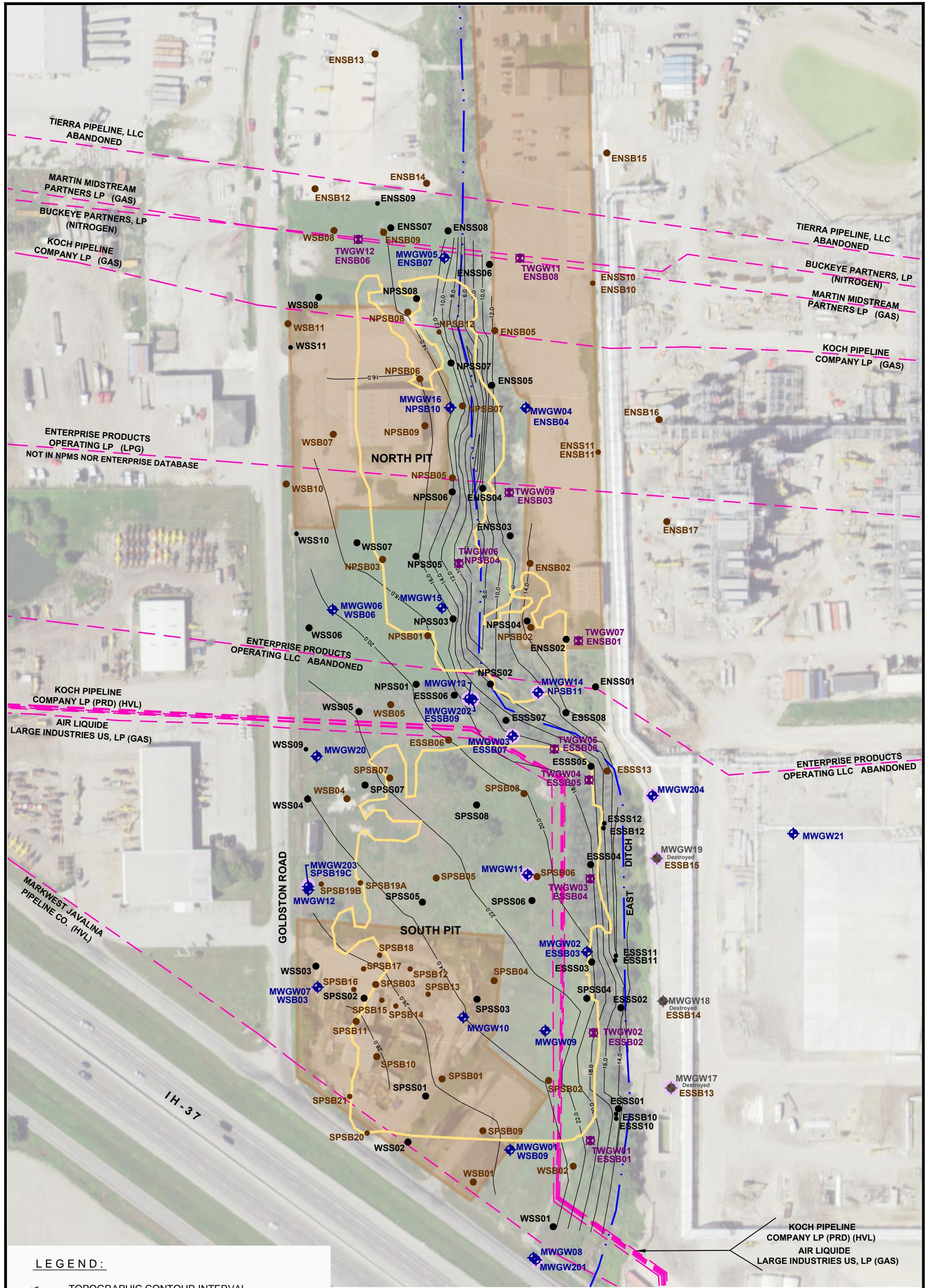
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7-12-17

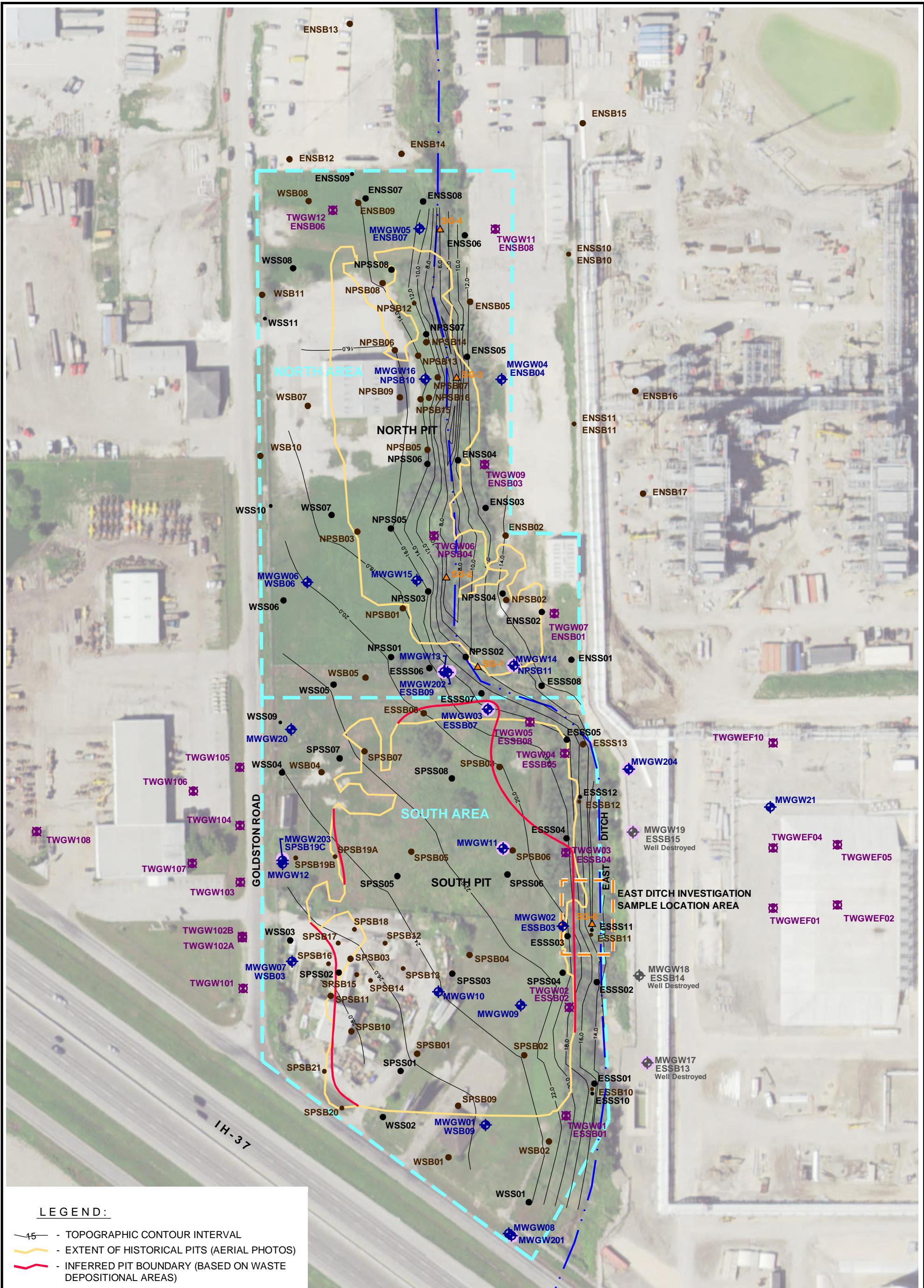
Project No.:
60399892

File Name:
Site Map.dwg

Figure No.:
2







Note:
UTU - Upper Transmissive Unit
STU - Second Transmissive Unit

Source:
2015 TOP Aerial Image from TNRIS - 0.5m Resolution
Topographic elevation contours and sample locations were surveyed by Frontier Surveying.

0 65 130 260
APPROXIMATE SCALE IN FEET

AECOM

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Terrestrial North and South Areas

Project: BRINE SERVICE COMPANY SUPERFUND SITE

Client: Brine Service Cooperating Parties

Project No.:	File Name:	Figure No.:
60399892	Terrestrial North and South Areas.dwg	5

Scale:

As Shown

Date:

8-14-17

Drawn by:

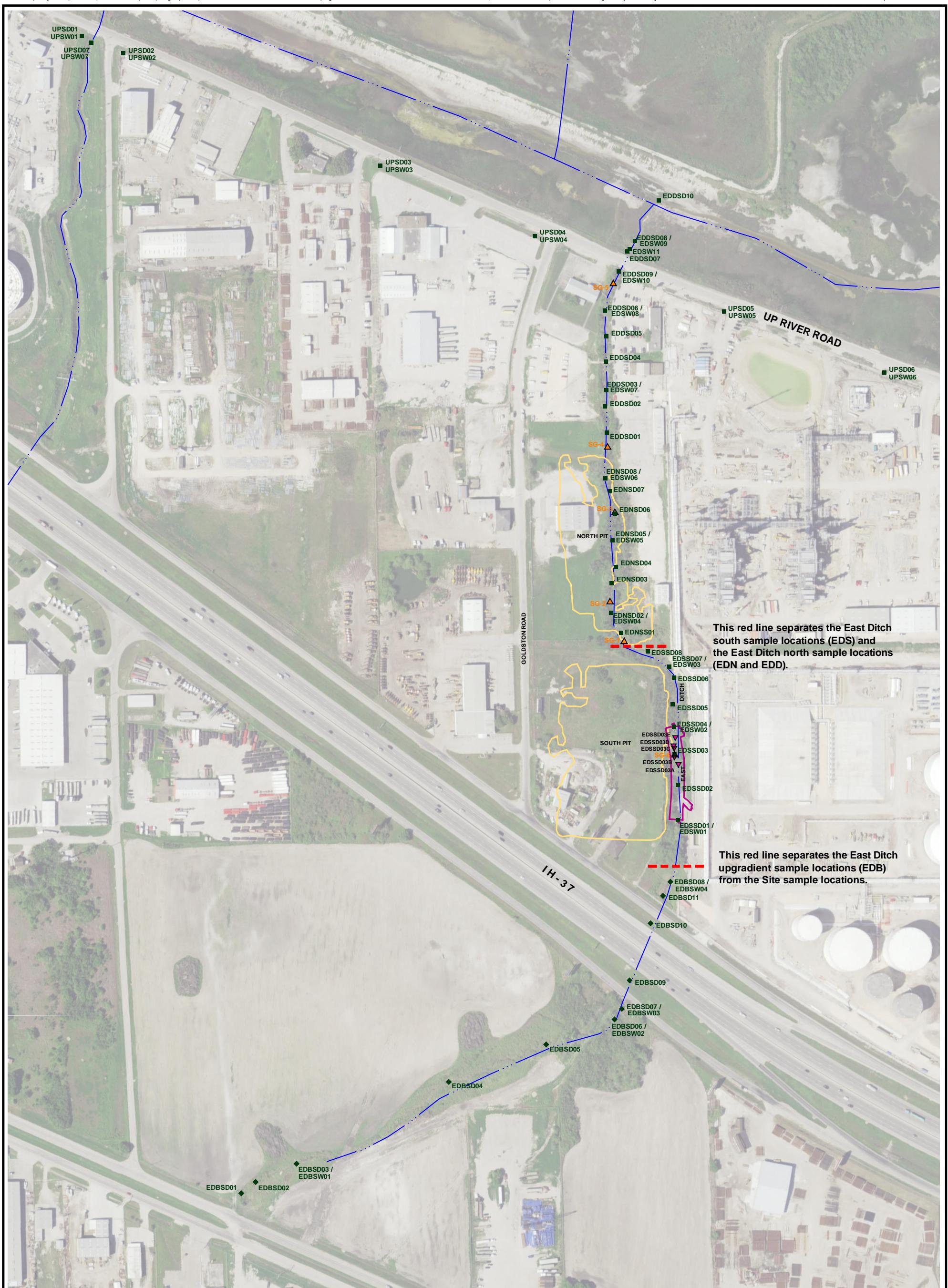
SJF

Chkd by:

MD/JH

Date:

8-14-17



LEGEND:

- EXTENT OF HISTORICAL PITS
- SURFACE WATER / SEDIMENT SAMPLE LOCATION
- BACKGROUND SAMPLE LOCATION
- STAFF GAUGE LOCATION
- 2017 EAST DITCH SEDIMENT LOCATION
- EAST DITCH EROSION CONTROL MAT

Note:

UTU - Upper Transmissive Unit
STU - Second Transmissive Unit

Source:

2015 TOP Aerial Image from TNRIS -
0.5m Resolution

Topographic elevation contours and sample
locations were surveyed by Frontier Surveying.

0 150 300 600
APPROXIMATE SCALE IN FEET



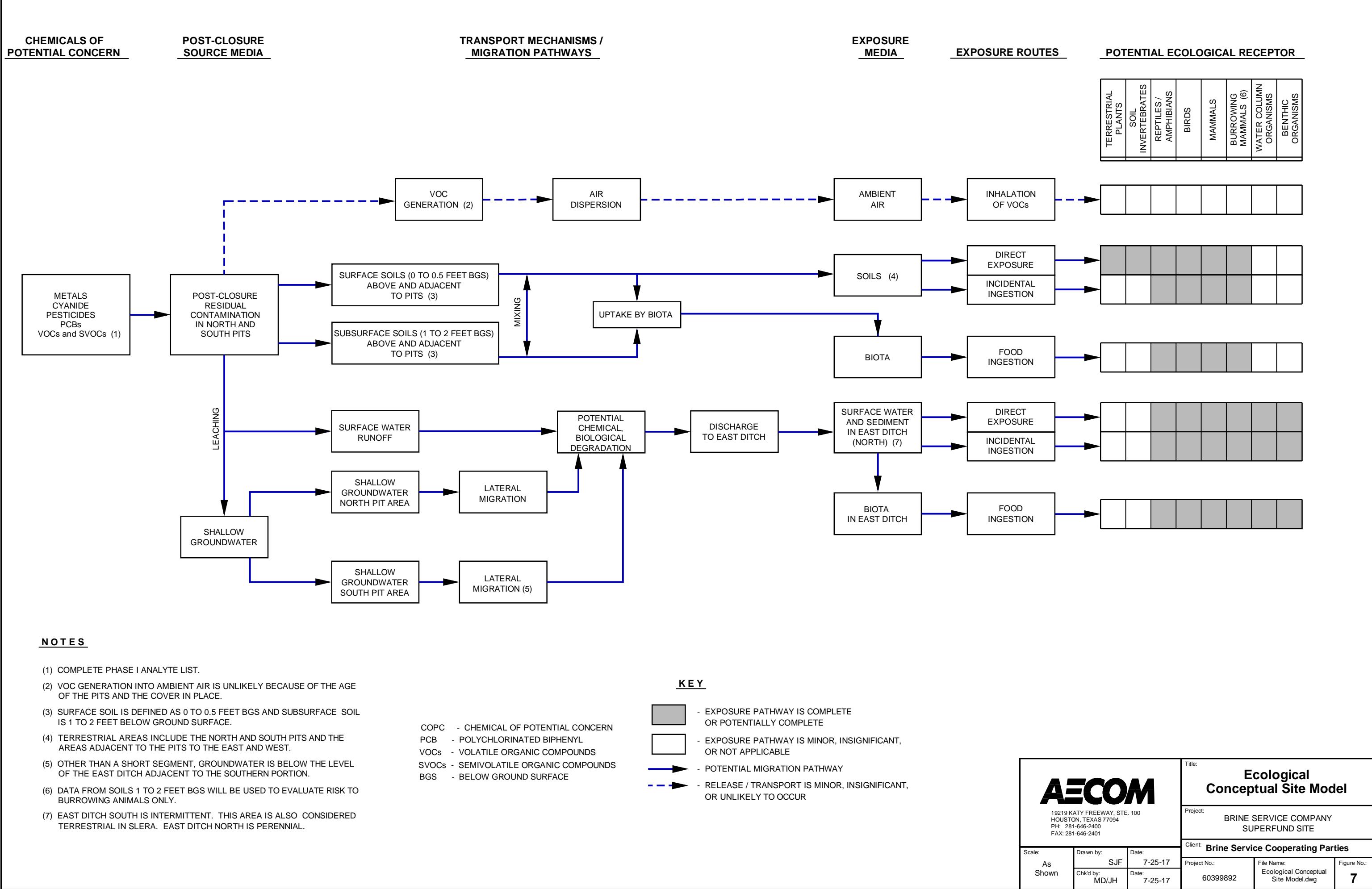
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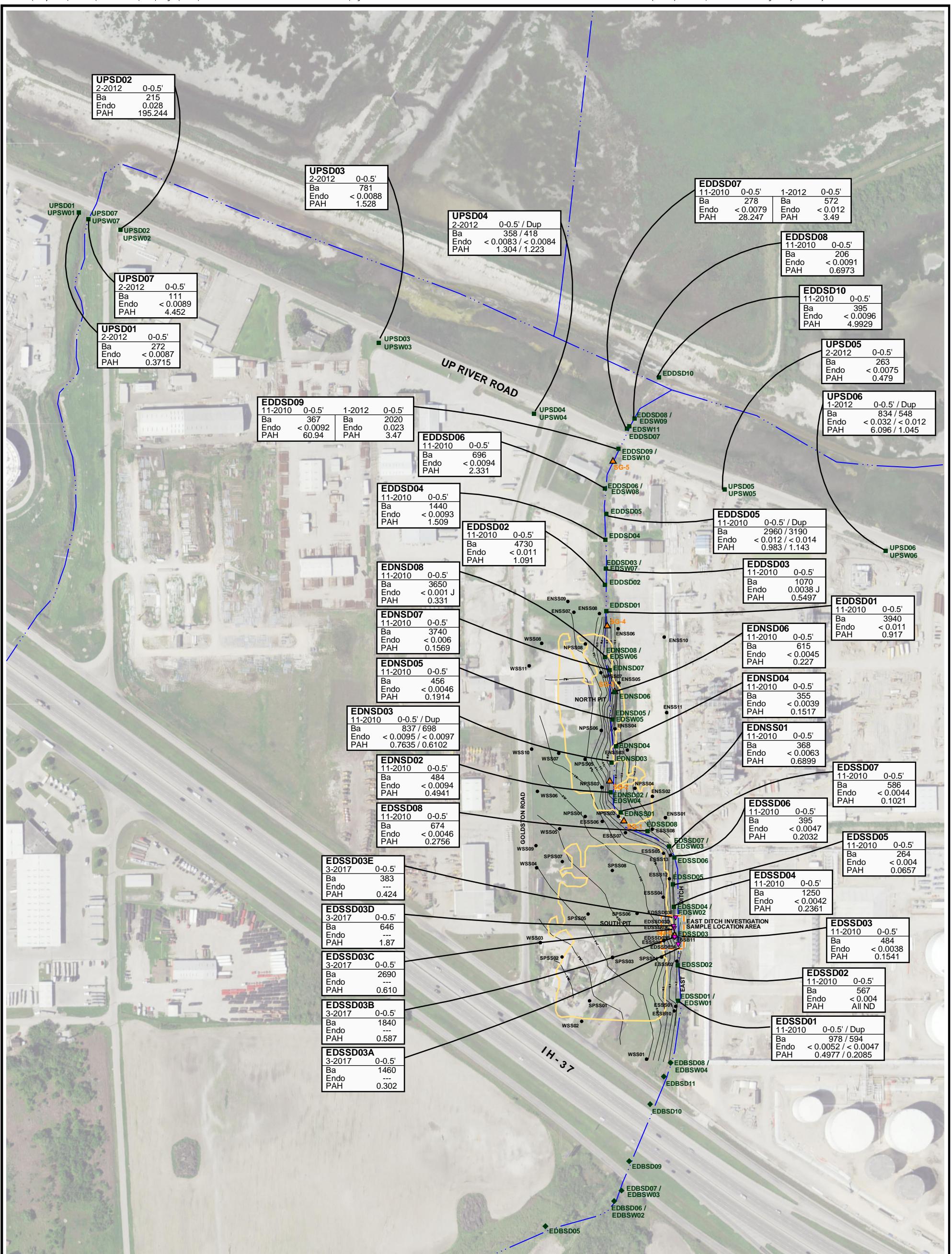
Surface Water and Sediment Sample Location Map

Project:
BRINE SERVICE COMPANY
SUPERFUND SITE

Client:
Brine Service Cooperating Parties

Project No.: 60399892 File Name: Surface Water and Sediment Sample Location Map.dwg Figure No.: 6



**LEGEND :**

- TOPOGRAPHIC CONTOUR INTERVAL
- EXTENT OF HISTORICAL PITS
- ◆ - BACKGROUND SAMPLE LOCATION
- - SURFACE SOIL SAMPLE LOCATION
- ▲ - WATER STAFF GAUGE LOCATION
- - SURFACE WATER / SEDIMENT SAMPLE LOCATION
- ▼ - 2017 EAST DITCH SEDIMENT LOCATION

Benchmark Screening Values		
Freshwater	Marine	
Ba = Barium	None	130.1
Endo = Endosulfan sulfate	None	None
PAH = Total PAHs	1.61	4.022

Note:

All results are reported in milligrams per kilogram (mg/Kg).

Source:

2015 TOP Aerial Image from TNRIS - 0.5m Resolution

Topographic elevation contours and sample locations were surveyed by Frontier Surveying.

0 150 300 600
APPROXIMATE SCALE IN FEET

AECOM19219 KATY FREEWAY, STE. 100
HOUSTON, TEXAS 77094
PH: 281-646-2400
FAX: 281-646-2401**Barium, Endosulfan sulfate, and Total PAH Concentrations in East Ditch (North) and Up River Road**

Project: BRINE SERVICE COMPANY SUPERFUND SITE

Client: Brine Service Cooperating Parties

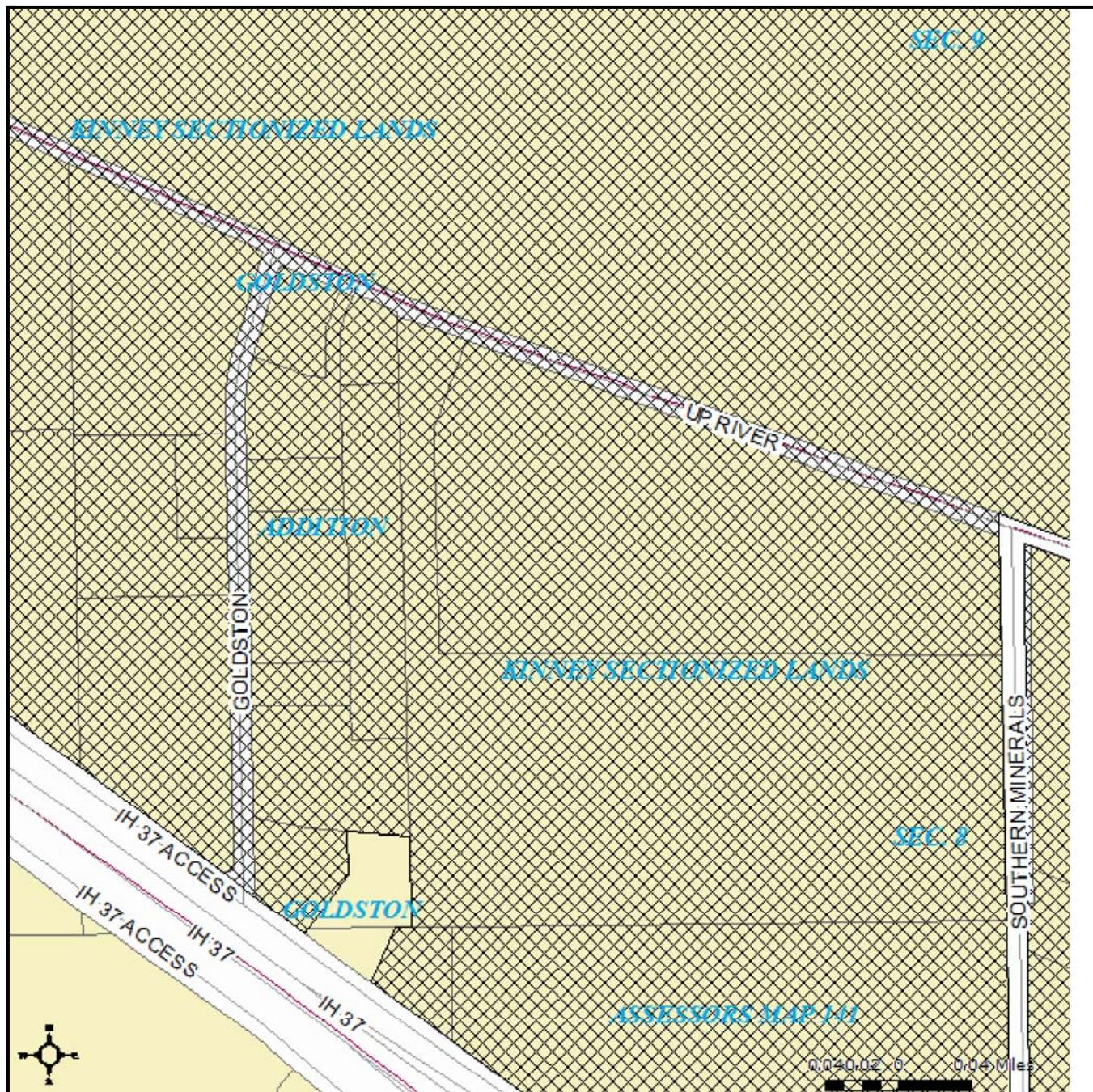
Project No.: 60399892 File Name: Barium-Endosulfan Sulfate-Total PAH Concentrations in East Ditch (North) and Up River Road.dwg

Figure No.: 9

APPENDICES

Appendix A-1 – Land-Use Evaluation

City of Corpus Christi Extraterritorial Jurisdiction (ETJ) Corpus Christi Map Viewer



ETJ



County Streets



Major Streets & Highways



Street Names

Centerlines



Centerlines County



Base Map



Base County



City Limits



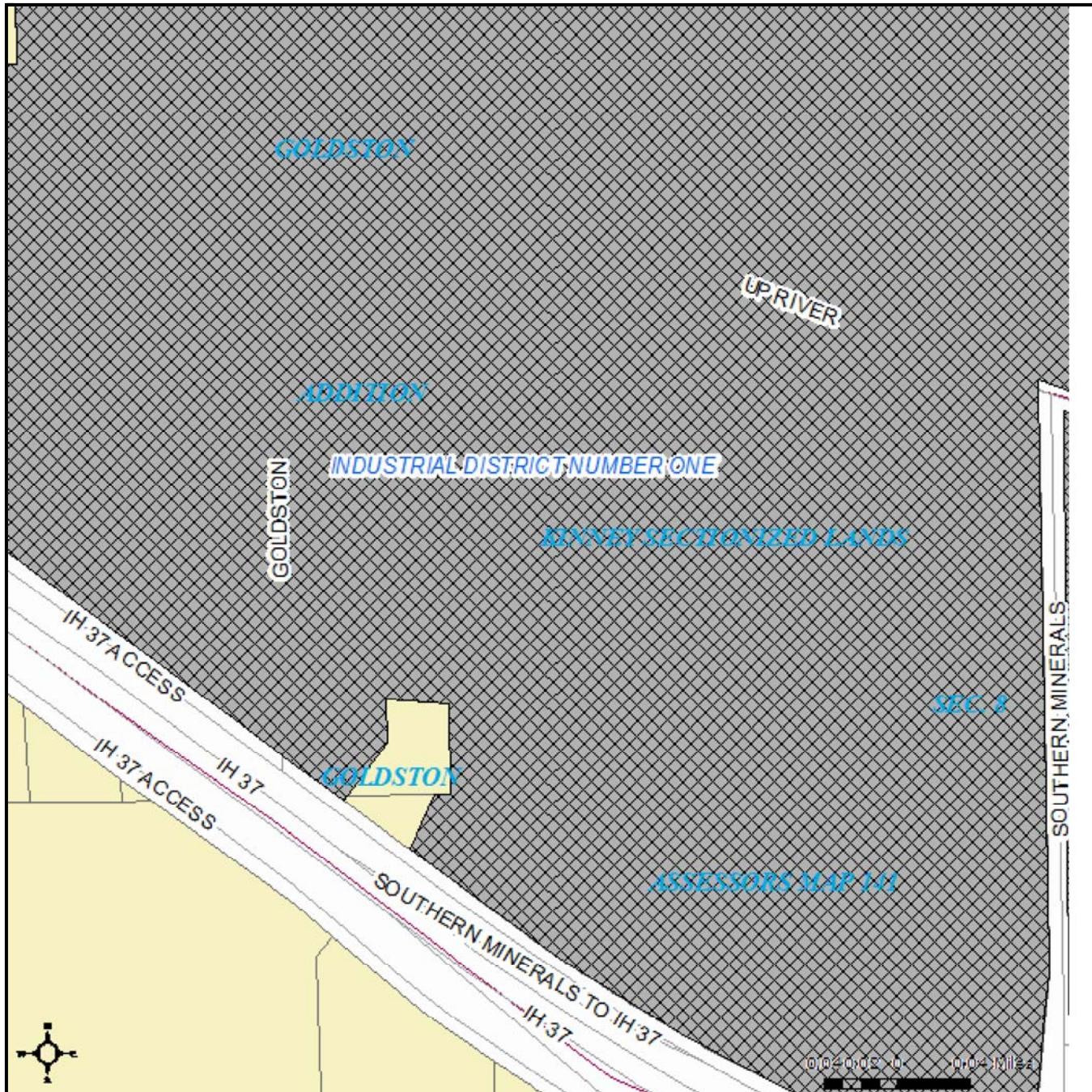
Subdivision Name

Copyright

Data Copyright (C) 2003 City of Corpus Christi

City of Corpus Christi Industrial District No 1

Corpus Christi Map Viewer

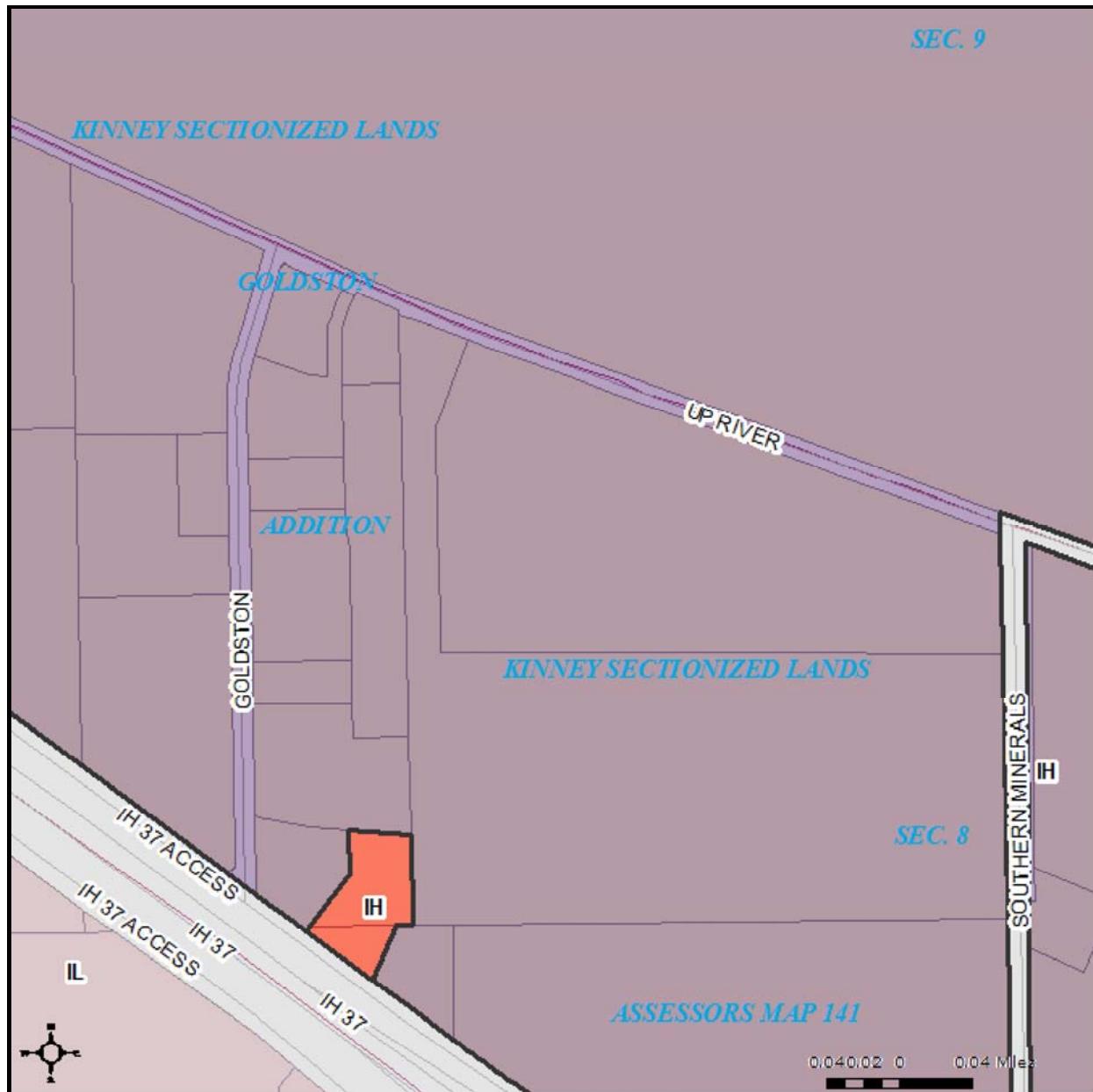


Copyright

Data Copyright (C) 2003 City of Corpus Christi

City of Corpus Christi Future Land Use

Corpus Christi Map Viewer



Zoning



Mixed Use



Proposed Industrial District

Planned Development

Agriculture/Rural Enterprise

Commercial

Government

Institutional

Heavy Industrial

Light Industrial

Low Density Single Family Residential

Medium Density Single Family Residential

Future Land Use (continued)

High Density Single Family Residential

Multifamily Residential

Mobile Home

Transition Aviation Special District

Transition Special District

Transportation

Permanent Open Space

Flood Plain Conservation

Water

County Streets

Major Streets & Highways

Street Names

Centerlines

Centerlines County

Base Map

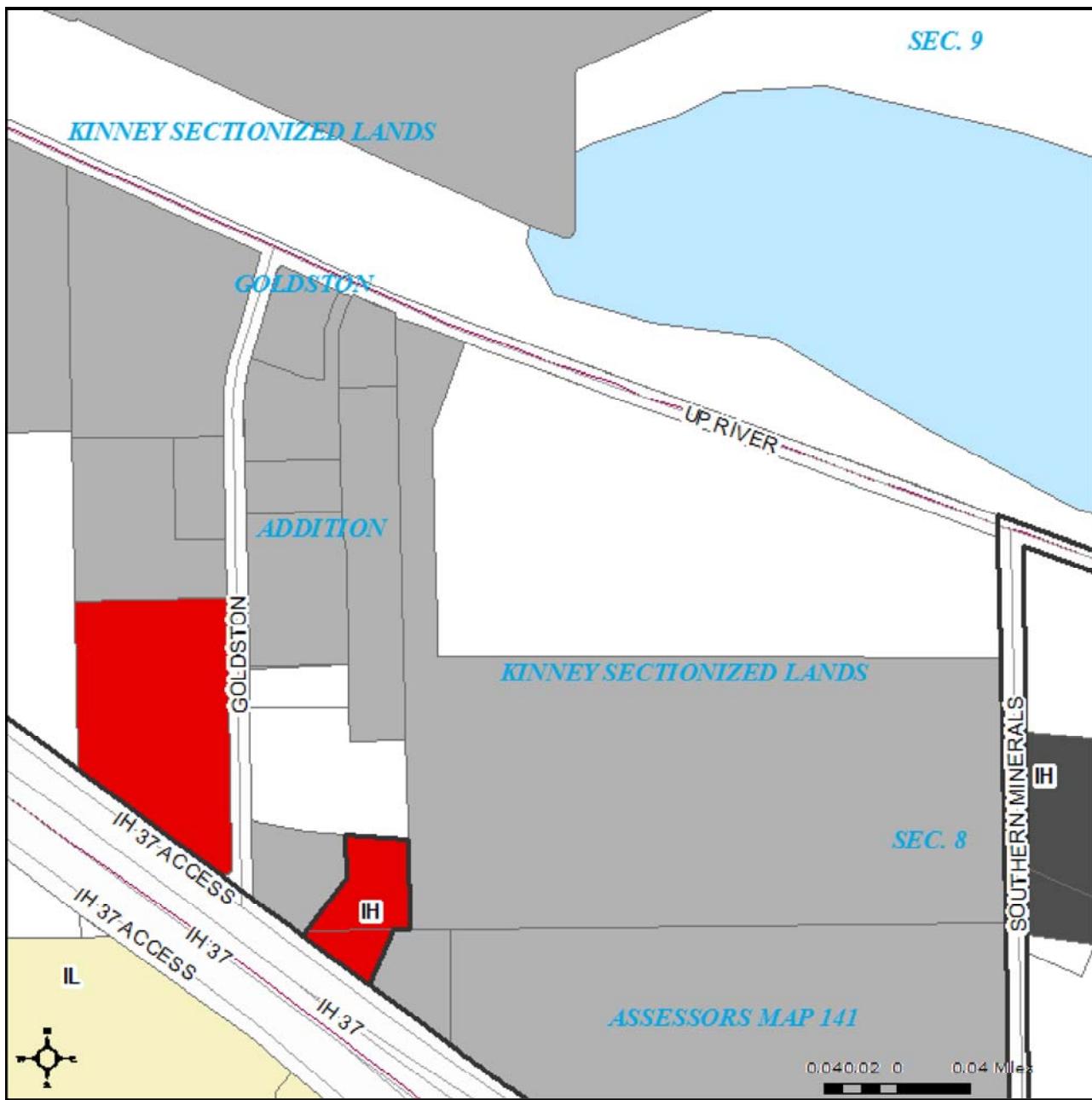
Base County

City Limits

Subdivision Name

City of Corpus Christi Zoning Map

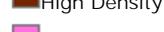
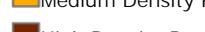
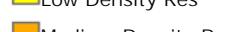
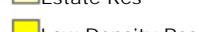
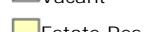
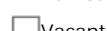
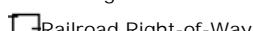
Corpus Christi Map Viewer



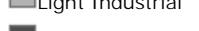
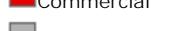
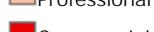
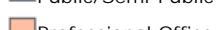
Zoning



Current Land Use



Current Land Use (continued)



County Streets



Major Streets & Highways

Street Names

Centerlines



Centerlines County



Base Map



Base County



City Limits



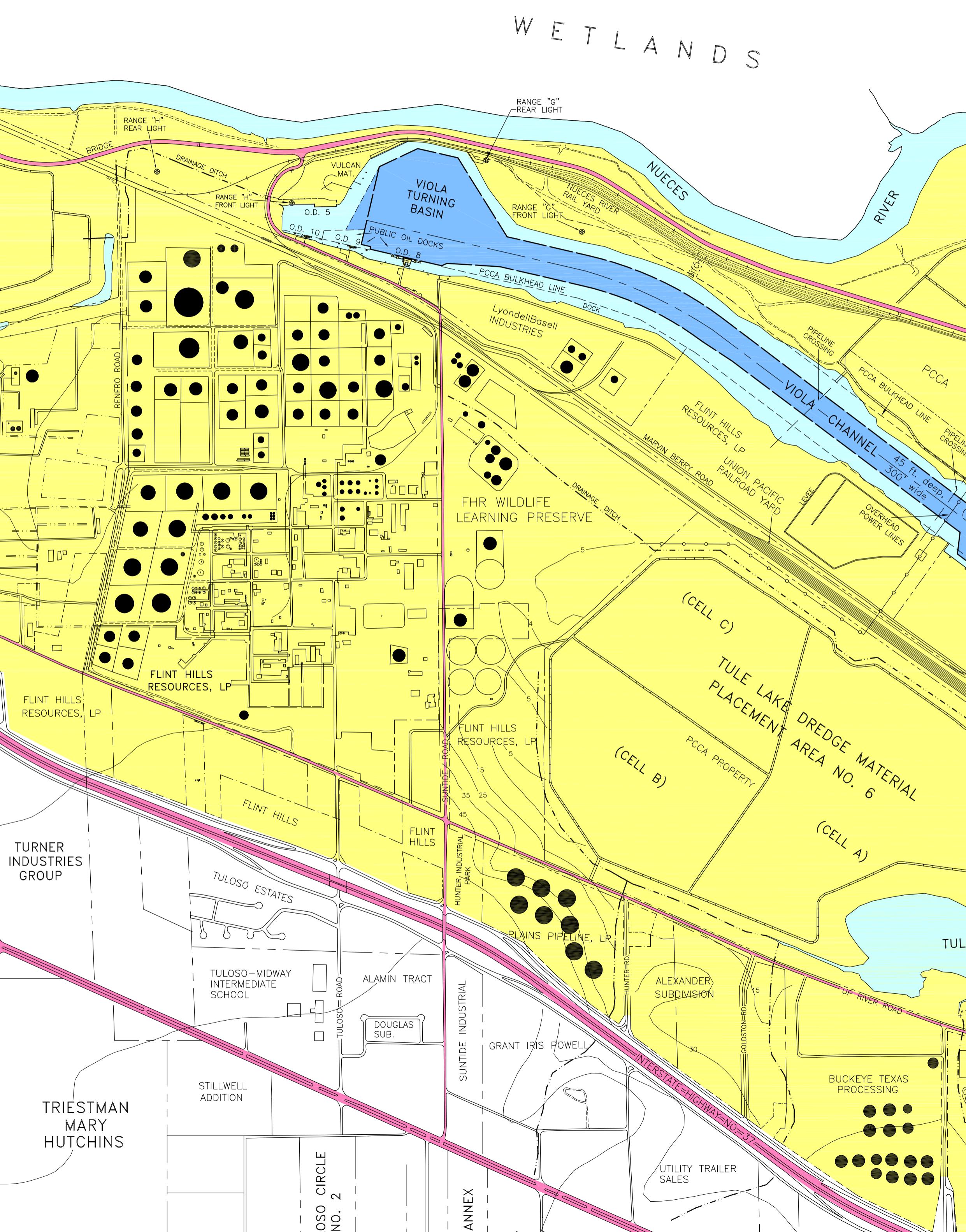
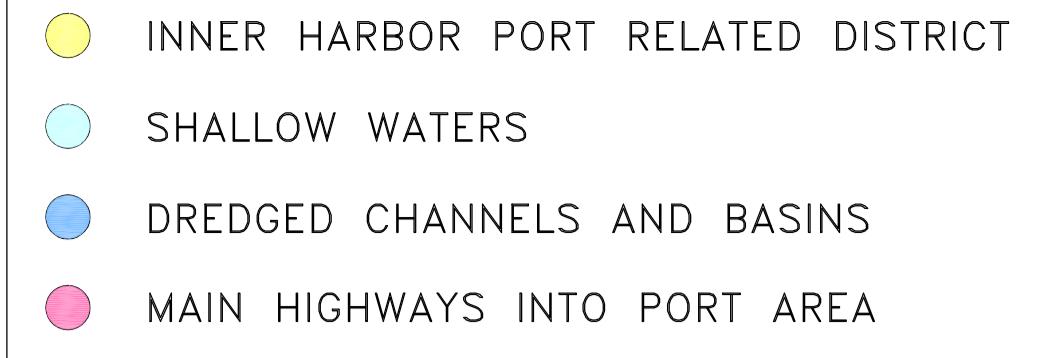
Subdivision Name



COCC 2017

**Port of Corpus Christi Inner
Harbor Port Related District**

POCC 2017



INDUSTRIAL DISTRICT AGREEMENT (SHORT FORM NO. 2)

THE STATE OF TEXAS §

452841

DEED RECORDS

COUNTY OF NUECES §

VOL 1981 PAGE 66

This Industrial District Agreement is entered into by and between the City of Corpus Christi, Texas, a municipal corporation of Nueces County, Texas, hereinafter called "City", and GOLDSTON CORPORATION, a TEXAS corporation, ("Landowner"), N/A, a corporation, ("Lessee"), and GOLDSTON CORPORATION, a TEXAS corporation, ("Improvements Owner"), hereinafter collectively called "Company".

This Agreement hereby incorporates by reference the provisions of the Industrial District Agreement for Corpus Christi Industrial District No. 33 (Master Form No. 2), recorded, beginning at Volume 1906, Page 414 in the Nueces County Deed Records, as follows:

1. All of the provisions of the "Witnesseth" section of said agreement on the first and second pages of said agreement, except that "Corpus Christi Industrial District No. 8" shall be substituted for "Corpus Christi Industrial District No. 33".
2. Articles I through XIV.
3. The attached Exhibits "A" and "B" are substituted in place of the Exhibits attached to the Industrial District Agreement for Corpus Christi Industrial District No. 33.

A copy of the master form for Industrial District Agreement referred to above is received by the Company on or before the time of execution of this Agreement.

Executed this 9th day of APRIL, 1984.

ATTEST:
CORPORATION
By: Douglas A. Bracken
ASST. Secretary
Name: DOUGLAS A. BRACKEN

GOLDSTON CORPORATION
(Company) LANDOWNER:

By: J. M. Goldston
Name: J. M. GOLDSTON
Title: PRESIDENT
Address: 7402 UP RIVER RD.
CORPUS CHRISTI, TX 78409

N/A
(Company) LESSEE:

By: _____
Secretary
Name: _____

By: _____
Name: _____
Title: _____
Address: _____

GOLDSTON CORPORATION
(Company) IMPROVEMENTS OWNER:

ATTEST:
CORPORATION
By: Douglas A. Bracken
ASST. Secretary
Name: DOUGLAS A. BRACKEN

By: J. M. Goldston
Name: J. M. GOLDSTON
Title: PRESIDENT
Address: 7402 UP RIVER RD.
CORPUS CHRISTI, TX 78409

CITY OF CORPUS CHRISTI, TEXAS

ATTEST:
Armando Chapa
By: Armando Chapa
G. Read, City Secretary

By: Edward A. Martin, City Manager

MS 4-0676 AUTHORIZED

BY COUNCIL 1-11-84

A.C.

SECRETARY

Corpus Christi Industrial District
No. 8 Agreement - Page 1 of 2

CITY OF CORPUS CHRISTI
LEGAL DEPARTMENT
P.O. BOX 9277
CORPUS CHRISTI, TEXAS 78469

BILL: 13 IMAGE 215

APPROVED: Day of 1985,
J. Bruce Aycock, City Attorney

By: Jay B. Dodgey
Jay B. Dodgey
Assistant City Attorney

By: Tom J. Basile
Thomas J. Basile
Assistant to the City Manager

LANDOWNER ACKNOWLEDGMENT

THE STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on APRIL 9,
1985, by J. M. GOLDSTON, PRESIDENT
(Landowner) on behalf of GOLDSTON CORPORATION, INC.

Linda A. Stramare
Name: LINDA A. STRAMARE
Notary Public, State of Texas
My Commission expires: 4/6/86

LESSEE ACKNOWLEDGMENT

THE STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on ,
1985, by ,
(title) on behalf of ,
(Lessee).

Name:
Notary Public, State of Texas
My Commission expires:

IMPROVEMENTS OWNER ACKNOWLEDGMENT

THE STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on APRIL 9,
1985, by J. M. GOLDSTON, PRESIDENT
(title) on behalf of GOLDSTON CORPORATION, INC.
(Improvements Owner).

Linda A. Stramare
Name: LINDA A. STRAMARE
Notary Public, State of Texas
My Commission expires: 4/6/86

CITY OF CORPUS CHRISTI'S ACKNOWLEDGMENT

THE STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on July 29,
1985, by Edward A. Martin as City Manager of the City of Corpus Christi,
Texas.

Lou Vargo
Lou Vargo
Notary Public, State of Texas
My Commission expires: 4-6-89

Goldman Corporation

ROLL 13 IMAGE 216

6524

VOL 1981 PAGE 68

EXHIBIT "A"

METES AND BOUNDS
OF A
19.575 ACRE TRACT

Being 19.575 acres of land out of the L. B. Hutchins 59.908 acre tract in Section 9, Range V of the H. L. Kinney Sectionalized Lands as described in Volume 564, Page 557, Deed Records of Nueces County, Texas, and Section 8, Range V of said H. L. Kinney Sectionalized Lands, said 19.575 acre tract being more particularly described by Metes and Bounds as follows:

BEGINNING at an iron pin at the northeast corner of this 19.575 acre tract, said northeast corner also being the northeast corner of said L. B. Hutchins 59.908 acre tract and said beginning point being on the south right-of-way line of Up River Road;

THENCE North 65° 35' 20" West along the south right-of-way line of Up River Road, 369.81 feet to the northwest corner of this tract, said northwest corner being on the intersection of the south right-of-way line of Up River Road with the East right-of-way line of Goldston Road;

THENCE South 17° 04' 17" West, along said east right-of-way line, 293.66 feet, to the beginning of a curve to the left;

THENCE along said curve having a radius of 500.00 feet and a central angle of 17° 53' 47", a distance of 156.18 feet;

THENCE still on said east right-of-way line, South 00° 49' 30" East, 1427.25 feet to a 5/8-inch iron rod being the southwest corner of this tract and also being at the intersection of said east right-of-way line of Goldston Road with the north right-of-way of Interstate Highway No. 37;

THENCE South 53° 17' 10" East along said north right-of-way line, 411.67 feet to a concrete right-of-way monument for a corner of this tract;

THENCE North 27° 52' 16" East, 172.48 feet to a corner of this tract being on the boundary line of said Section 9, Range V and Section 8, Range V of the H. L. Kinney Sectionalized Lands;

THENCE South 89° 23' 13" East, along said boundary line, 45.50 feet to a corner of this tract;

THENCE North 1° 03' 34" West along the east boundary of this tract 187.48 feet to a turning point in the east boundary of this tract;

THENCE North 1° 00' 00" West and still on the east boundary of this tract and the east boundary of the L. B. Hutchins 59.908 acre tract, at 371.38 feet pass a chisel mark in the bottom of a concreted drainage ditch, at 442.74 feet pass a 1-inch iron pipe, in all 1616.16 feet to the point of beginning and containing 19.575 acres of land, more or less.

INDUSTRIAL DISTRICT AGREEMENT
GOLDSTON CORPORATION
EXHIBIT "A"

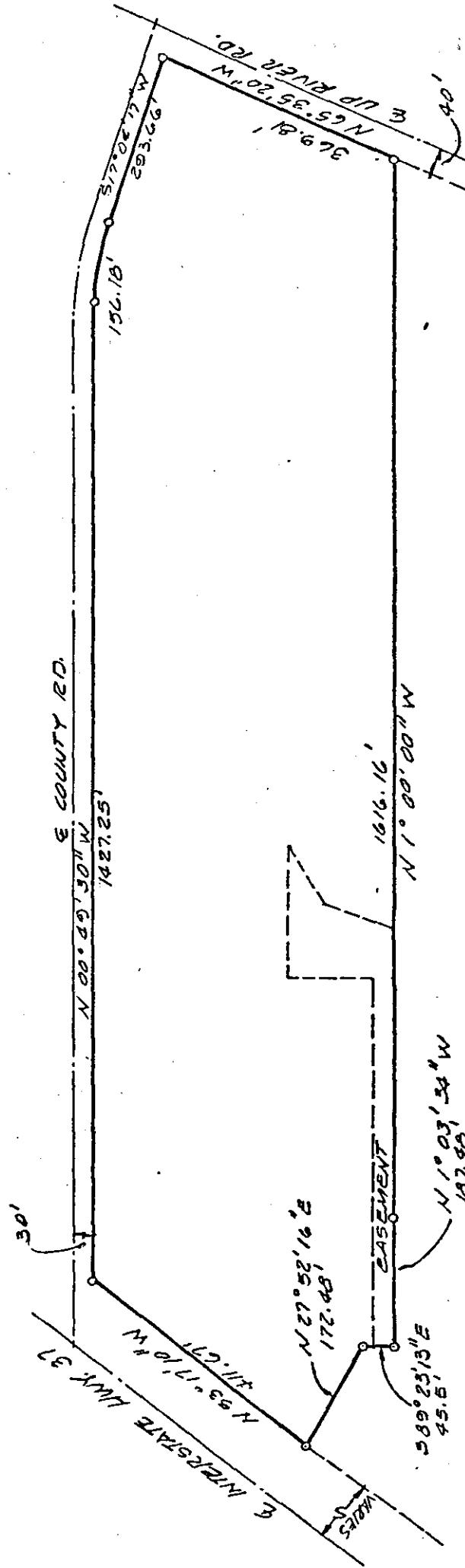
ROLL 13 IMAGE 218

BENING 10.575 ACRES OF LAND, MORE OR LESS,
OUT OF THE C. B. HUTCHINS 5900 ACRES TRACT
IN SECTION 9, RANGE IT OF THE H.L. KENNEDY
SECTIONIZED CANOES, 100, 604, T.O.R., PAGE 557,
VOL. 593, PAGE 281, N.C.O.R., NELSON COUNTY
TEXAS.

VOL 1981 PAGE 70

VIII 1981 PAGE 30

ستاد



INDUSTRIAL DISTRICT AGREEMENT
GOLDSTON CORPORATION
EXHIBIT "A" J.F. 1} FILE 510

452841 ✓

K.P.S.

ROLL 13 IMAGE 219

FILED FOR RECORD
SEP 12 9:59 AM '85
Marion Uehlinger
COUNTY CLERK NUECES COUNTY TX

VER-6

1312
City of Corpus Christi

STATE OF TEXAS }
COUNTY OF NUECES }

I hereby certify that this instrument was FILED on the
date and at the time stamped hereon by me; and was duly
RECORDED in the Volume and Page of the named RECORDS
of Nueces County, Texas, as stamped hereon by me, on

SEP 12 1985



Marion Uehlinger
COUNTY CLERK
NUECES COUNTY, TEXAS

DEED RECORDS

VOL 1981 PAGE 71

Appendix A-2 – Habitat Use Evaluation

The field habitat evaluation was completed on October 19, 2010 and is presented in this appendix in its original form. Edits to common and scientific plant species names as requested in the agency comments on the screening-level ecological risk assessment were incorporated into Sections 2.1.2 and 2.1.3.

Memorandum

The purpose of this memorandum is to document the findings of the October 19, 2010 habitat evaluation for the Brine Service Company, Inc. Site (the "Site) located in Corpus Christi, Nueces County, Texas with detailed consideration given to the likelihood of utilization of the site by special status species as listed in Attachment A. The term "special status species" includes those species identified by Federal Endangered Species Act (50 CFR 17) or by the State of Texas as endangered, threatened or as a candidate for listing. This list also includes those species identified by Texas as "rare" but with no regulatory status.

Executive Summary

The Site is located in an industrial area of Corpus Christi, Texas and is comprised of maintained terrestrial grass habitat and an intermittent drainage ditch that flows along the eastern portion of the Site to Tule Lake. Ecological resources at the Site are limited for terrestrial and aquatic receptors by the maintenance of the grassy areas, industrial activities and the intermittent nature of the drainage channel. The likelihood of special status species for Nueces County utilizing the Site for nesting or foraging was assessed and it was determined that the ecological risk assessment does not need to represent any of the special status upper trophic level receptors. Although the habitat of the lower reach of the ditch could support several special status species (e.g., reddish egret or white-faced ibis), it is unlikely that they will be present due to the close proximity of roadways and active businesses/industry. Additionally, more suitable habitat is available nearby in Tule Lake. Several species of plants and one snake (Gulf Saltmarsh Snake) could also be present based on habitat conditions. The evaluation of the analytical data as presenting a risk to plants and reptiles will be discussed in the SLERA.

1.0 Site Background

The Site is located in an industrial area in Corpus Christi, Nueces County, Texas, along the north side of Interstate Highway 37 (IH-37), northeast of the intersection of the IH-37 feeder road and Goldston Road. Figure 1 provides an overall site layout. The Site consists of two backfilled pit areas, referred to as the North Pit and the South Pit. The larger of the two pits, the South Pit, was documented as a former waste disposal pit. Several pipeline easements traverse the Site.

The Site is bounded on the west by Goldston Road, on the east by an industrial area, on the south by the frontage road to IH-37, and on the north by a parking area for the Nueces Occupational Medical Clinic on Up River Road. A cellular tower is located in the north portion of the South Pit (see Photo 1 in Attachment B). The cellular tower is accessed from Goldston Road via an access agreement. Photo 2 shows a typical view of the grassy area of the site. Several active businesses are present on or adjacent to the Site. A commercial truck tire facility is located in the north pit and accessed via Goldston Road (Photo 3). A trucking and repair facility borders the North Pit to the east and is accessed via Up River Road. In the southwest corner of the South Pit is Robert's, a heavy equipment repair center (Photo 4), accessed via the IH-37 Frontage Road. Just to the south of the South Pit is a video store (Photo 4) also accessed via the IH-37 Frontage Road. Bordering the South Pit to the east is a lay down yard. The Flint Hills Resources West Refinery (Flint Hills) is located approximately 1.25 miles northwest of the Site and the Citgo Refinery West Plant (Citgo) is located approximately 0.5 mile east of the Site. The Tule Lake Industrial Park along Up River Road is directly east of the Site and an equipment yard accessed by Southern Minerals Road is located directly east of the southern portion of the Site. The Nueces Power Equipment facility and King-Isles Construction Services facilities are located west of the Site.

A man-made drainage ditch currently located along the east side (East Ditch, Photos 5-12) empties into the Northwest Ditch (wetlands) north of Up River Road and then extends to Tule Lake (shallow brackish water wetlands). Tule Lake flows into Corpus Christi Inner Harbor, which in turn flows into Corpus Christi Bay. Based on a review of historical aerial photographs and topographic maps, it appears that the course of the East Ditch has evolved and matured over time from a small drainage swale to a more engineered drainage channel. The banks of the ditch vary from gentle to somewhat steep.

Based on visual observations during the October 19, 2009 USEPA and Respondent site visit, the upper reach of the East Ditch adjacent to the South Pit may not hold water throughout the year. The middle reach of the East Ditch north of the concrete lined section was observed to contain intermittent pools. Surface water in the lower reach appeared to be several feet deep during the October 19, 2009 site visit and may be perennial in nature. The elevation of the concrete culvert under Up River Road appears to limit flow to the north toward the Northwest Ditch during low flow periods (minimal upstream contribution). During the October 19, 2009 USEPA and Respondent site visit, several surface water outfalls into the East Ditch were observed. During ongoing field activities from September 27, 2010 to December 12, 2010 the upper most reach and the engineered portion ("S" Curve) of the East Ditch appeared to hold water for only short periods of time following a heavy rain. One such event occurred on September 19, 2010. The Corpus Christi area received approximately seven inches of rainfall in a 24-hr period. The "S" Curve completely dried within two weeks following this rainfall event. This portion of the East Ditch is influenced by rainfall and surface water drainage. Approximately 900 feet south of Up River Road and 200 feet north of the "S" Curve, the lower most reach of the East Ditch, continually held water throughout URS' three month presence on-site. The remainder of the ditch is dry except immediately following a rainfall event.

Both the Northwest Ditch and Tule Lake are classified as wetlands. Tule Lake empties into the Corpus Christi Inner Harbor and into Corpus Christi Bay (TCEQ, 2000). Corpus Christi Inner Harbor (Surface Water Segment 2484) is a man-made navigation channel that connects the Port of Corpus Christi to Corpus Christi Bay. The water uses for Corpus Christi Inner Harbor are noncontact recreation and intermediate aquatic life. There is one permitted municipal wastewater discharge (City of Corpus Christi) and 29 industrial wastewater discharges, including American Chrome and Chemicals, Flint Hills Refinery, and Valero Refining into Surface Water Segment 2484.

The Corpus Christi Bay (Surface Water Segment 2481 of the Bays and Estuaries) is a large, open water bay that is directly west of the Padre/Mustang barrier island complex, which separates it from the Gulf of Mexico (TCEQ, 2000). The water uses for this segment as designated are contact recreation, exceptional aquatic life, and oyster waters. Corpus Christi Bay is accessible to the public and is used for recreation as well as recreational and commercial fishing (TCEQ, 2000).

2.0 Remedial Investigation

The Remedial Investigation (RI) for the Site includes an evaluation of both human health and ecological risks. One of the tasks in the screening level ecological risk assessment (SLERA) is an assessment of the probability of special status species utilizing the Site. In order to categorize the attributes and habitat available to ecological receptors and the RI data, the Site has been separated into five terrestrial and six aquatic units that constitute ecological areas to be investigated in the RI:

- Terrestrial Areas - generally maintained and mowed grass areas
 - Soils from the South Pit (South Pit Soils Investigation Unit)
 - Soils from the North Pit (North Pit Soils Investigation Unit)
 - Soils on the East side of the South Pit (East Soils Investigation Unit South)

- Soils on the East side of the North Pit (East Soils Investigation Unit North)
- Soils on the west side of both North and South Pits (West Soils Investigation Unit)
- Aquatic Areas
 - East Ditch Sediment Investigation Unit South
 - East Ditch Sediment Investigation Unit North
 - East Ditch Background Sediment Investigation Unit
 - East Ditch Downstream Sediment Investigation Unit
 - East Ditch Background Surface Water Investigation Unit
 - East Ditch Surface Water Investigation Unit

As described in the Revised Final RI Work Plan (URS, 2010), further evaluation of the ecological resources provided by the ecological areas will be presented in the SLERA including: human maintenance activities, future land use and potential development; and potential use of the Site by threatened and endangered species due to the proximity of a sensitive area (Tule Lake). This evaluation addresses the latter of these items: the potential use of the Site by threatened and endangered species. This evaluation does not address the potential use of Tule Lake or the Northwest Ditch for any species, but focuses on the Site.

2.1 Habitat Evaluation

On October 19, 2010 a habitat evaluation was conducted for the Site by an URS ecologist. The majority of the site consists of a mixture of commercial/industrial facilities, including associated parking lots, and maintained (mowed) grassy areas. The eastern boundary of the property is defined by the East Ditch and its riparian vegetation.

Significant ecological habitat was not observed within the industrial/commercial facilities and their parking lots.

The maintained grassy areas were dominated by non-native grasses including including Bermudagrass (*Cynodon dactylon*), guineagrass (*Urochloa maxima*), and shortspike windmill grass (*Chloris subdolichostachya*) as well as the native Kleburg bluestem (*Dichanthium annulatum*). Also within the grassy area were a few scattered shrubs/small trees including mimosa (*Albizia julibrissin*) and mesquite (*Prosopis glandulosa*). Photos 1-5 in Attachment B show the grassy portions of the Site; including the industrial/commercial facilities discussed in Section 1.

Although narrow, the riparian corridor along the East Ditch contained shrubs and small trees including mesquite, mimosa, and sugarberry (*Celtis laevigata*) along its entire length. As described above, the East Ditch can be divided into upper, middle and lower reaches based on hydrologic permanence and substrate type.

Within the upper reach of East Ditch, upstream of the concrete-lined "S" curve the riparian corridor included green ash (*Fraxinus pennsylvanica*) and yaupon in addition to the species listed above. Dominant plants found within the channel included mimosa and guineagrass. Photos 6 and 7 show the upper reach of the East Ditch.

The middle and upper reaches of the East Ditch were dry with no perennial pools on the day of the site visit. Photos 8, 9, and 10 show the concrete-lined portion of the East Ditch. Although concrete lined, numerous breaks in the concrete and sediment collected on top of the concrete supported vegetation within the channel.

The dominant species observed within the channel included Kleburg bluestem, guineagrass, mimosa, and buffelgrass (*Pennisetum ciliare*).

The lower reach of the East Ditch, adjacent and to the south of Up River Road contained water at the time of the site visit. In addition to the riparian species listed, retama (*Parkinsonia aculeate*), palmetto (*Sabal minor*), Johnson grass (*Sorghum halpense*), Kleburg bluestem, and guineagrass were also present in the riparian corridor. The banks of the channel were lined in places with Gulf cordgrass (*Spartina spartinae*) and cattails (*Typha sp.*) were observed within the channel, adjacent to the Up River Road culvert. Photos 11 and 12 show the lower reach of East Ditch.

2.2 Special Status Species Evaluation

The Nueces County listing for rare species is presented in Attachment A. Each of the species listed by the Texas Parks & Wildlife Department (TPWD) is discussed below with regards to the relevance of the Site's habitat to these species. Additionally, the TPWD completed an assessment of their records in September 2000 on the potential presence of rare, threatened and endangered species within or near the Tule Lake and Corpus Christi Ship Channel in Nueces County (TCEQ, 2000). Those species with known occurrence records in the general vicinity in 2000 are noted below with an asterisk.

2.2.1 Amphibians

Black-spotted newt (*Notophthalmus meridionalis*) – The Black-Spotted Newt is typically found in permanent or ephemeral wetlands, ponds, and other slow-moving, low-salinity waters (AmphibiaWeb, 2010). It is unlikely that East Ditch provides adequate habitat for the Black-Spotted Newt because storm-flows would likely have velocities that are high enough to preclude the newt during significant rain events followed by times of complete dryness in the creek.

*Sheep frog (*Hypopachus variolosus*) – Adult Sheep Frogs are most commonly found in moist, subterranean burrows in open woodlands or pasturelands with abundant short grass cover (AmphibiaWeb, 2010). Reproduction is aquatic and typically occurs in temporary pools following heavy rains. Aside from East Ditch, which would have a high flow rate during storm events that would preclude it from serving as tadpole habitat, no areas were observed on the Site that would be likely to hold water for a sufficient time to provide adequate breeding habitat. Due to the disturbed nature of the maintained grassy areas of the Site, it is unlikely to contain adequate habitat for Adult Sheep Frogs.

2.2.2 Birds

American Peregrine Falcon (*Falco peregrinus anatum*) – The American Peregrine Falcon nests in the Western United States (including the Trans-Pecos region of Texas), Canada, and Mexico (Campbell, 2003). If found in Nueces County, American Peregrines would be present on a migratory or wintering basis only. The Site consists of industrial/commercial buildings, maintained grassy areas, and an intermittent drainage ditch. None of these areas are likely to provide suitable hunting habitat for the American Peregrine.

Arctic Peregrine Falcon (*Falco peregrinus tundrius*) – The Arctic Peregrine Falcon nests in the Arctic, and utilizes the Texas coastline as migratory habitat, with some individuals inhabiting the area for up to a month before continuing their migration to South America (Campbell, 2003). While migrating through Texas, the Arctic Peregrine will feed along the open coastline and within tidal flats. Although migrating Arctic Peregrines occur seasonally in the area, no suitable hunting habitat is found on the Site.

Brown Pelican (*Pelecanus occidentalis*) – The Brown Pelican nests on small, isolated islands and feed on fish in open-water coastal areas (Campbell, 2003). Pelican Island, in Corpus Christi Bay, is a bird sanctuary and home to many nesting pelicans. Although pelicans were observed in Tule Lake and are found in the area, the Site does not contain adequate nesting or hunting habitat for Brown Pelicans.

Eskimo Curlew (*Numenius borealis*) – Although breeding in the Arctic, historic records indicate that the Eskimo Curlew were present in Coastal Texas on a migratory basis (Campbell, 2003). Because they are nearly extinct, their habitat preference is poorly understood. Historic records indicate that they are adaptable to feeding in a variety of habitats, including sand flats, fields, ponds, and wetlands. Because these birds are extremely rare, and Coastal Texas is only a temporary stop during migration, it is unlikely that the Site currently provides habitat for the Eskimo Curlew.

Mountain Plover (*Charadrius montanus*) – The Mountain Plover does not breed in Coastal Texas; breeding is limited to high plains prairies (Knopf and Wunder, 2006). Most birds winter in California, but there are reports of Mountain Plovers wintering in Texas on coastal prairies, alkaline flats, tilled fields, and heavily grazed grasslands. No such habitat is found on the Site and it is therefore unlikely that it is utilized by the Mountain Plover.

Northern Aplomado Falcon (*Falco femoralis septentrionalis*) – In southern Texas, Northern Aplomado Falcon habitat includes coastal prairie and marsh habitats that support small islands of trees and shrubs or that interface with woodlands along freshwater drainages and estuaries (Campbell, 2003). No coastal prairie or marsh habitat is located on the Site, and it is therefore unlikely that Northern Aplomado Falcons utilize the site.

Peregrine Falcon (*Falco perigrinus*) – See the discussions above for the two subspecies: American Peregrine Falcon and Arctic Peregrine Falcon.

Piping Plover (*Charadrius melanotos*) – Piping Plovers are known to winter in Coastal Texas where they prefer bare or sparsely vegetated tidal mudflats, sand flats, and algal flats (Campbell, 2003). No such habitat exists on the Site and it is therefore unlikely that the Piping Plover utilize the Site.

*Reddish Egret (*Egretta rufescens*) – In Texas, the Reddish Egret will nest on artificial or natural islands in low vegetation or on bare sand and will forage on shallow coastal flats, ponds, and lagoons (Lowther and Paul, 2002). This species has been identified as inhabitating the three nearest rookeries to the Site (TPWD, 2000). The Site does not provide nesting habitat for the Reddish Egret. The Reddish Egret may sporadically use the lower reaches of East Ditch as foraging habitat but it is much more likely to be found in the shallow flats associated with Tule Lake. Reddish Egrets have not been observed during any of the recent field events and the close proximity of an active roadway and businesses on either side of the lower reaches of the East Ditch would discourage foraging.

Sennet's Hooded Oriole (*Icterus cucullatus sennetti*) – Hooded Orioles have been found in the Rio Grande Valley of Texas (south of Nueces County) in patches of Texas Ebony (*Pithecellobium feixicaule*) and Mesquite brush (*Prosopis*) where they build nests in Spanish moss (Pleasant and Albano, 2001). The Hooded Oriole consumes insects, fruit, and nectar and forages in trees, shrubs, and brushy habitat adjacent to their nesting sites and are rarely observed on the ground. No Texas Ebony was identified on the Site, although there were scattered mesquite shrubs/trees. No nests or Spanish moss were observed within the mesquite at the site, and it is not believed that the Site provides nesting habitat for the Oriole. Because the Hooded Oriole does not forage on the ground the grassy areas of the site would not provide suitable foraging habitat. There are shrubs and trees in

the riparian area adjacent to East Ditch, but the lack of nesting habitat makes it unlikely that the Hooded Oriole would forage in this area.

Snowy Plover (*Charadrius alexandrinus*) – The snowy plover is a ground nesting bird found primarily on unvegetated to sparsely vegetated coastal beaches and shores of inland alkaline lakes (Page et al., 2009). No such habitat exists on the site and therefore the Snowy Plover is unlikely to utilize the Site.

Sooty Tern (*Sterna fuscata*) – The Sooty Tern spends the majority of its life as a marine bird, returning to land only to nest (Schreiber et al., 2002). Breeding habitat tends to be on remote islands that are infrequently visited by humans. No habitat for the Sooty Tern occurs on the Site.

Southeastern Snowy Plover (*Charadrius alexandrinus tenuirostris*) – See entry above for the Snowy Plover. Subspecies habitat preferences are the same as those identified for the main species.

Texas Botteri's Sparrow (*Aimophila botterii texana*) – Texas Botteri's Sparrow is a ground-nesting bird that is found in various types of grasslands, including periodically inundated coastal prairies and higher elevation grasslands with a scattered shrub layer (Webb and Bock, 1996). Because the grassy areas of the Site are maintained by mowing, the Site does not contain any habitat that is usable by the Botteri's Sparrow.

Western Burrowing Owl (*Athene cunicularia hypugaea*) – The Burrowing Owl's natural habitat is found in dry, open, shortgrass, treeless plains, often associated with burrowing mammals (Haug et al., 1993). It is also known to inhabit vacant lots, golf courses, etc. where animal burrows are available for its use. No burrows or burrowing animals were observed in the grassy portion of the Site and it is unlikely that the Site provides adequate habitat for the Burrowing Owl.

Western Snowy Plover (*Charadrius alexandrinus nivosus*) – See entry above for the Snowy Plover. Subspecies habitat preferences are the same as those identified for the main species.

White-faced Ibis (*Plegadis chihi*) – In Texas, the White-faced Ibis primarily nests in shallow wetlands of the outer coastal plain with islands of vegetation; however, the Ibis has also been reported nesting on bare ground dominated by sea oxeye (Ryder and Manry, 1994). In Texas, the winter range is the same coastal wetlands utilized for nesting. Although the Ibis may be found in Tule Lake adjacent to the Site, no nesting habitat is found on the Site. It is possible that the Ibis may sporadically forage within the lower reaches of East Ditch, however, this was not observed and the close proximity of an active roadway and businesses on either side of the lower reaches of the East Ditch would discourage foraging.

White-tailed Hawk (*Buteo albicaudatus*) – The White-Tailed Hawk is found in open or semi-open grasslands, prairies, or savannas with a woody overstory of 0 – 40 %, cultivated or fallow agricultural fields are not acceptable, but the species will tolerate cattle pasture which has not been overgrazed (Farquhar, 2009). Due to the maintenance of the grassy areas of the property, no suitable habitat for the White-tailed Hawk is found on the Site.

Whooping Crane (*Grus Americana*) – The Whooping Crane is known to winter in Coastal Texas, primarily in the marshes and salt flats of the Aransas National Wildlife Refuge and adjacent wetland areas. No large, open wetland areas occur on the Site, and it is unlikely that Whooping Cranes utilize the Site.

Wood Stork (*Mycteria Americana*) – No breeding colonies of Wood Stork are found in Texas; however, the Wood Stork will winter in trees within and adjacent to the coastal marshes of Aransas, Calhoun, and Refugio Counties (Coulter et al. 1999, Appendix A). Feeding habitat for the Wood Stork includes natural and man-made wetlands ranging in size from very small (small pools and drainage ditches) to large (> 500,000 m²). If present in Tule Lake or other Nueces County wetlands, it is possible that the Wood Stork could sporadically use the lower reaches of East Ditch for foraging; however, the close proximity of an active roadway and businesses on either side of the lower reaches of the East Ditch would discourage foraging.

2.2.3 Fishes

American Eel (*Anguilla rostrata*) – The American Eel is found in freshwater, brackish, and marine waters at different portions of its lifecycle; during the freshwater portion of its lifecycle, the American Eel is typically found in permanent streams with continuous flow (Page and Burr, 1991). Due to the intermittent nature of the ditch, the Site does not have habitat suitable for the American Eel.

Opossum Pipefish (*Microphis brachyurus*) – The Opossum Pipefish inhabits freshwater streams, rivers, and estuaries, with adults most often occurring in freshwater areas (Dawson, 1985). The intermittent nature of the ditch makes it unlikely that Pipefish utilize the Site.

Smalltooth Sawfish (*Pristis pectinata*) – The Smalltooth Sawfish inhabits shallow coastal waters of tropical seas and estuaries. No such habitat is found on the Site.

Texas Pipefish (*Sygnathus affinis*) – The Texas Pipefish is found in coastal lagoon habitats (Robins et al., 1991). No such habitat is found on the Site.

2.2.4 Insects

Manfreda Giant-Skipper (*Stallingsia maculosus*) – Larvae of the Manfreda Giant Skipper feed upon agave plants, specifically *Manfreda maculosa*, and possibly other members of the genus (Quinn, 2010). No agave plants were observed at the Site, and it is therefore unlikely that the Manfreda Giant Skipper utilizes the Site.

2.2.5 Mammals

Maritime Pocket Gopher (*Geomys personatus*) – The Maritime Pocket Gopher occurs in deep, sandy soils and is entirely absent from gravelly, stony, or clayey soils (Texas Tech, 1997). Although some sandy soils may be present on the site, the majority of the soils are clayey, and it is therefore unlikely that the Maritime Pocket Gopher utilizes the site. Since this species is considered rare with no regulatory listing, it is not represented in the ecological assessment as a special status species. The Texas Pocket Gopher could act as a surrogate species, if it were determined that the Maritime Pocket Gopher were of concern at that Site.

Ocelot (*Leopardus pardalis*) – The Ocelot occurs in dense, thorny shrub lands, typically with greater than 75 % shrub cover (Campbell, 2003). No such habitat occurs on the site, and it is unlikely that the Ocelot would utilize the Site.

Plains Spotted Skunk (*Spilogale putorius interrupta*) – The Plains Spotted Skunk is found most commonly in open grasslands, brushy areas, and cultivated land. Their dens are located below ground in grassy banks, rocky crevices or along fence rows, as well as above ground in hay stacks, woodpiles, hollow logs or trees or brush heaps (MDOC, 2000). The Plains Spotted Skunk is adaptable to a variety of habitats and it would be difficult to determine its presence or absence on the

Site; however since this species is considered rare with no regulatory listing, it is not represented in the ecological assessment as a special status species. The raccoon could act as a surrogate species, if it were determined that the plains spotted skunk were of concern at that Site.

Red Wolf (*Canis rufus*) – The Red Wolf has been extirpated from the area and will not utilize the Site (Appendix A).

Southern Yellow Bat (*Lasiurus ega*) – The Southern Yellow Bat has been recorded in Nueces County and is associated with trees that can provide them with daytime roosting sites; the bats will leave the roosting sites at night to feed on insects (Texas Tech, 1997). The only trees identified on the Site were associated with the riparian corridor of East Ditch and no bats were observed. It is unlikely that the Southern Yellow Bat utilizes the Site.

West Indian Manatee (*Trichechus manatus*) – The Manatee inhabits the Gulf and bay system (Appendix A). No such habitat is located on the Site.

White-nosed Coati (*Nasua narica*) – The White-nosed Coati inhabits woodland areas of Southern Texas, spending time both on the ground and in trees; although not reported from Nueces County, the Coati has been recording in nearby counties (Texas Tech, 1997). The Site does not contain woodland areas and it is unlikely that the White-nosed Coati would utilize the Site.

2.2.6 Reptiles

Atlantic Hawksbill Sea Turtle (*Eretmochelys imbricate*) – Atlantic Hawksbill Sea Turtles are found in warm, shallow waters of the Gulf and bay system and nest on sandy beaches (Appendix A). No such habitat is found on the Site.

Green Sea Turtle (*Chelonia mydas*) – The Green Sea Turtles are found in the Gulf and bay system and nest on sandy beaches (Appendix A). No such habitat is found on the Site.

*Gulf Saltmarsh Snake (*Nerodia clarkia*) – The Gulf Saltmarsh Snake prefers brackish and saltwater estuaries, salt marshes, and tidal mudflats where it feeds upon small fish, crabs, shrimp, and other invertebrates (TPWD 2009a). Although it is unlikely that the lower reaches of the East Ditch provide primary habitat for Gulf Saltmarsh Snakes, it is possible that they could sporadically feed in the area due to the Site's adjacency to Tule Lake.

Keeled Earless Lizard (*Holbrookia propinqua*) – The Keeled Earless Lizard prefers sandy environments and is common on sand dunes and barrier beaches within its range (UT, 1999b). No such habitat occurs on the Site, and it is therefore unlikely that the Keeled Earless Lizard utilizes the Site.

Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) – Kemp's Ridley Sea Turtles are found in the Gulf and bay system and nest on sandy beaches (Appendix A). No such habitat is found on the Site.

Leatherback Sea Turtle (*Dermochelys coriacea*) – Leatherback Sea Turtles are found in the Gulf and bay system and nest on sandy beaches (Appendix A). No such habitat is found on the Site.

Loggerhead Sea Turtle (*Caretta caretta*) – Loggerhead Sea Turtles are found in the Gulf and bay system and nest on sandy beaches (Appendix A). No such habitat is found on the Site.

Spot-tailed Earless Lizard (*Holbrookia lacerata*) – The Spot-tailed Earless Lizard prefers rocky desert flats, areas with sparse vegetation, or mesquite-prickly pear associations (UT, 1999d). No such habitat was observed on the Site, and it is therefore unlikely that the lizard utilized the Site.

*Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*) – The Texas Diamondback Terrapin is found in brackish or salt water estuaries, tidal creeks, and saltwater marshes (TPWD, 2009b). No such habitat occurs within the Site.

Texas Horned Lizard (*Phrynosoma cornutum*) – Texas Horned Lizards are found in patchy habitats that are characterized by areas of bare ground (~ 40 percent) interspersed with native vegetation (TPWD, 2008). No such habitat was observed on the Site and it is unlikely that the Horned Lizard utilizes the Site.

Texas Indigo Snake (*Drymarchon corais erubennus*) – The Indigo Snake prefers moist, dense riparian corridors in thornbrush woodlands and mesquite savannahs of the coastal plain and requires microhabitats, such as rodent burrows for shelter (UT, 1999a, Appendix A). Although the ditch has a vegetated riparian corridor, the small size of the corridor, intermittent nature of most of the creek, and the development of the surrounding land make it unlikely that the Site contains adequate habitat for the Indigo Snake.

Texas Scarlet Snake (*Cemophora coccinea lineri*) – Along the Gulf Coast, the Texas Scarlet snake is found in sandy thickets or mixed hardwood scrub on sandy soils (UT, 1999c, Appendix A). Although some trees are found in the riparian corridor of ditch, the majority of the site contains clayey soils. Therefore, no suitable habitat for the Texas Scarlet Snake is found on the Site, and it is unlikely that the snake utilizes the Site.

*Texas Tortoise (*Gopherus berlandieri*) – The Texas Tortoise is found in South-Central Texas and feeds on prickly pear cactus and other succulents (TPWD, 2009c). No prickly pear or other succulent cacti were observed on the Site, and it is therefore unlikely that the Texas Tortoise would utilize the Site. The continual site maintenance activities minimized potential for prickly pear or other cacti to vegetate.

2.2.7 Plants

*Elmendorf's Onion (*Allium elmendorfii*) – Elmendorf's Onion is found in grassland openings in oak woodlands on deep, loose, well-drained sands. In the vicinity of Corpus Christi and the Coastal Bend, Elmendorf's Onion would occur on Pleistocene barrier island ridges and on the Holocene Sand Sheet that support live oak woodlands (Poole et al., 2007). No such habitat was found on the Site and it is unlikely that the Onion would be found on the Site.

*Lila de los Llanos (*Echeandia chandleri*) – Lila de los Llanos is most commonly found among shrubs or in grassy openings in subtropical thorn shrublands on somewhat saline clay of lomas (hill or ridge having a broad top) along the Gulf Coast near the mouth of the Rio Grande (Poole et al., 2007). No such habitat was found on the Site and it is unlikely that the Lila de los Llanos would be found on the Site.

Mexican Mud-Plantain (*Heteranthera mexicana*) – The Mexican Mud-Plantain is found in the wet, clayey soils of resacas and ephemeral wetlands in South Texas (Poole et al., 2007). No such habitat was found on the Site and it is unlikely that the Mexican Mud Plantain would be found on the Site.

*Plains Gumweed (*Grindelia oolepis*) – The Plains Gumweed is found in the Coastal Prairies on heavy clay (blackland) soils, often in depressional areas; sometimes persisting in areas with such soils where management (mowing) may maintain or mimic natural prairie disturbance regimes (Poole et al., 2007). Although not observed in the grassy areas of the Site, it is possible that the Site has soils and conditions that would be suitable for the Plains Gumweed.

*Slender Rushpea (*Hoffmannseggia tanella*) – The Slender Rushpea is found on coastal prairie grasslands on level uplands and on gentle slopes along drainages, usually in areas of shorter, or sparser vegetation (Poole et al., 2007). Although not observed in the grassy areas or along the East Ditch, it is possible that the Site has soils and conditions that would be suitable for the Slender Rushpea.

*South Texas ambrosia (*Ambrosia cheiranthifolia*) – South Texas ambrosia is found in grasslands and mesquite-dominated shrublands on various soils, ranging from heavy clays to lighter-textured sandy loams, mostly over the Beaumont Formation on the coastal plain (Poole et al., 2007). Although not observed in the grassy areas of the Site, it is possible that the Site has soils and conditions that would be suitable for South Texas Ambrosia.

*Texas Windmill-Grass (*Chloris texensis*) – Texas Windmill Grass is found on sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes(Poole et al., 2007). Although not observed in the grassy areas of the Site, it is possible that the Site has soils and conditions that would be suitable for Texas Windmill-Grass.

Welder Machaeranthera (*Psilactis heterocarpa*) – Welder Machaeranthera is found in grasslands, varying from intact midgrass coastal prairies to shrub-invaded or weedy pastures, and open mesquite-huisache woodlands on nearly level, gray to dark gray clayey to silty soils over the Beaumont and Lissie formations (Poole et al., 2007). Although not observed in the grassy areas of the Site, it is possible that the Site has soils and conditions that would be suitable for Welder Machaeranthera.

3.0 Application to SLERA

The following species will be used for food web modeling for the SLERA:

- Terrestrial System
 - Herbivorous mammals – Eastern cottontail, Texas pocket gopher (1-2 foot zone only)
 - Omnivorous mammal – White-footed mouse, nine-banded armadillo (combination of surface and subsurface exposure)
 - Carnivorous mammal – Coyote
 - Herbivorous Bird – Mourning Dove
 - Omnivorous Bird - American robin
 - Carnivorous Bird – Red-tailed hawk
- Aquatic System (Drainage Ditch)
 - Herbivorous mammal – Eastern cottontail

- Omnivorous mammals – Raccoon and Least Shrew
- Carnivorous mammal – Coyote
- Omnivorous Bird – Red-winged blackbird
- Carnivorous Bird – Snowy Egret

These species are both known to be susceptible to food web exposures or are representative prey of organisms that are susceptible to food web exposures (USEPA, 1993). They reflect a range of trophic levels (e.g., large carnivorous mammal as compared to a small omnivorous mammal) and thus dietary exposure. Furthermore, dietary and toxicological information is available for these species, making them good candidate species for food web modeling (e.g., USEPA, 1993, Sample et al., 1996). As such, the selected species can be used as surrogate species to represent the types of exposures and potential impacts that could occur to other wildlife species at the Site. These animals are commonly found in the vicinity of the Site.

The assessment of special status species does not indicate that any of these upper trophic level receptors should be evaluated using only the No Observed Adverse Effect Level (NOAEL) to represent exposures to special status individuals. Although the habitat of the lower reach of the ditch could support several special status species (e.g., reddish egret or white-faced ibis), it is unlikely that they will be present due to the close proximity of roadways and active businesses/industry. Additionally, more suitable habitat is available nearby in Tule Lake. Several species of plants and one snake (Gulf Saltmarsh Snake) could also be present based on habitat conditions. The evaluation of the analytical data as presenting a risk to plants and reptiles will be discussed in the SLERA.

4.0 References

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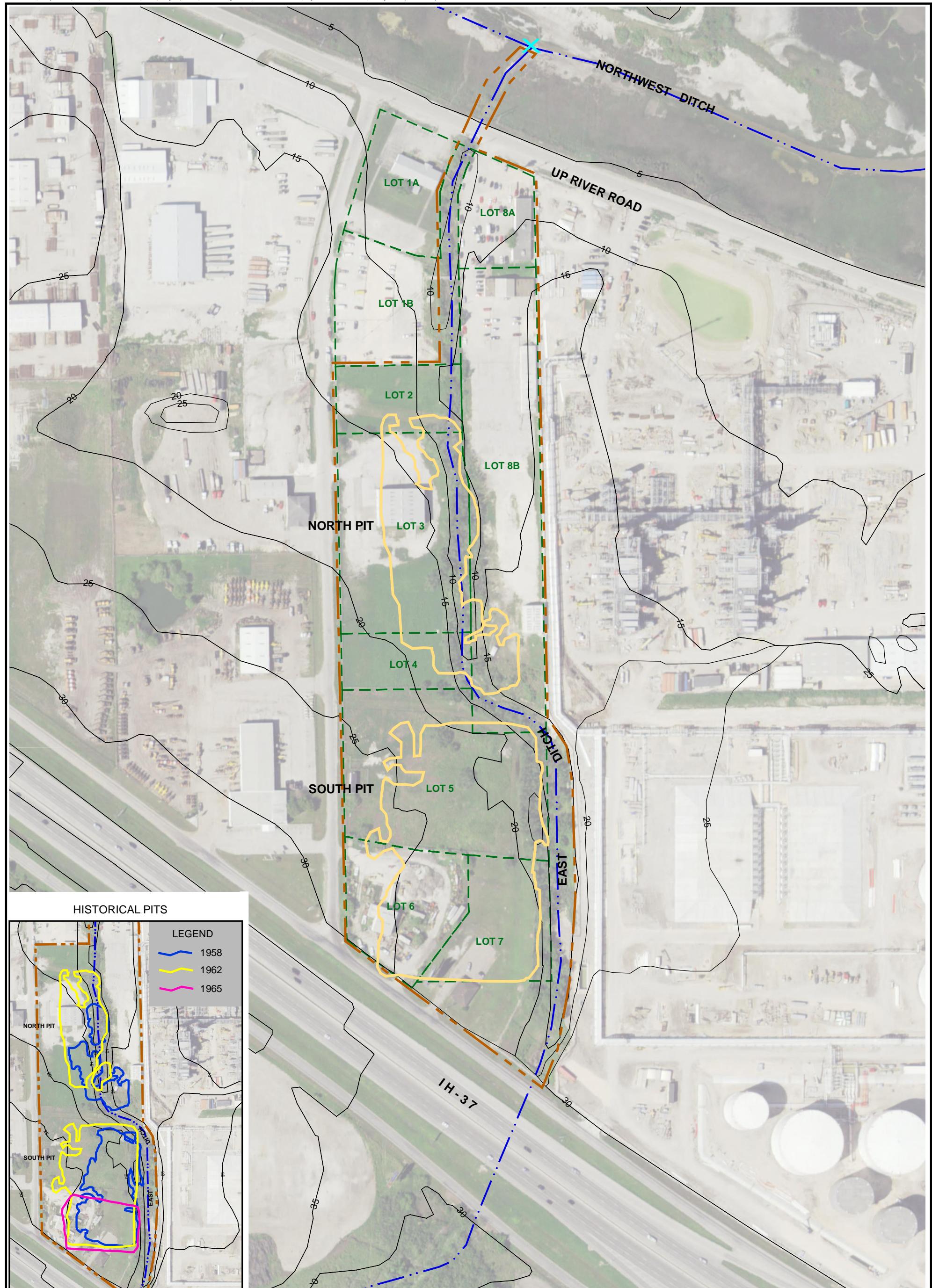
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Figure



LEGEND :

- TOPOGRAPHIC CONTOUR INTERVAL
- SITE BOUNDARY
- LOT BOUNDARY
- EXTENT OF HISTORICAL PITS
- DOWNTSTREAM AOC LIMIT OF INVESTIGATION

Source:

2015 TOP Aerial Image from TNRIS - 0.5m Resolution

Topographic Elevation Contours from the U.S.G.S.
7.5-minute Series Topographic Quadrangle Maps for
Annsville and Corpus Christi, Texas, 1975.

0 200 400
APPROXIMATE SCALE IN FEET



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Title:

Site Map

Project: BRINE SERVICE COMPANY
SUPERFUND SITE

Client: Brine Service Cooperating Parties

Scale: As Shown	Drawn by: SJF	Date: 6-15-17
Chkd by: MD/JH	Date: 6-15-17	Project No.: 60399892 File Name: Site Map.dwg Figure No.: 1

Attachment A
Texas Parks & Wildlife Department Annotated County List of Rare Species
Nueces County – Updated 7/19/2010

Key:

LE, LT	Federally Listed Endangered/Threatened
PE, PT	Federally Proposed Endangered / Threatened
SAE, SAT	Federally Listed Endangered / Threatened by Similarity of Appearance
C	Federal candidate for listing, formerly Category 1 Candidate
DL, PDL	Federally Delisted / Proposed for Delisting
E, T	State Listed Endangered / Threatened
NT	Not Tracked or no Longer Tracked by State
"blank"	Rare, but with no regulatory status

Source: Texas Parks & Wildlife Department; Wildlife Division, Diversity and Habitat Assessment Programs, County Lists of Texas' Special Species Nueces County 7/19/2010

NUECES COUNTY
AMPHIBIANS

		Federal Status	State Status
Black-spotted newt	<i>Notophthalmus meridionalis</i>		T
can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River			

Sheep frog *Hypopachus variolosus* T
predominantly grassland and savanna; moist sites in arid areas

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Brown Pelican	<i>Pelecanus occidentalis</i>	DL	E
largely coastal and near shore areas, where it roosts and nests on islands and spoil banks			
Eskimo Curlew	<i>Numenius borealis</i>	LE	E
historic; nonbreeding: grasslands, pastures, plowed fields, and less frequently, marshes and mudflats			
Mountain Plover	<i>Charadrius montanus</i>	PT	
breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous			
Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	LE	E
open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (<i>F. p. anatum</i>) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, <i>F. p. tundrius</i> is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see			

subspecies for habitat.

Piping Plover	<i>Charadrius melanotos</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Reddish Egret	<i>Egretta rufescens</i>		T
resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear			
Sennett's Hooded Oriole	<i>Icterus cucullatus sennetti</i>		
often builds nests in and of Spanish moss (<i>Tillandsia usneoides</i>); feeds on invertebrates, fruit, and nectar; breeding March to August			
Snowy Plover	<i>Charadrius alexandrinus</i>		
formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast			
Sooty Tern	<i>Sterna fuscata</i>		T
predominately 'on the wing'; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July			
Southeastern Snowy Plover	<i>Charadrius alexandrinus tenuirostris</i>		
wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats			
Texas Botteri's Sparrow	<i>Aimophila botterii texana</i>		T
grassland and short-grass plains with scattered bushes or shrubs, sagebrush, mesquite, or yucca; nests on ground of low clump of grasses			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows			
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>		
uncommon breeder in the Panhandle; potential migrant; winter along coast			
White-faced Ibis	<i>Plegadis chihi</i>		T
prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats			
White-tailed Hawk	<i>Buteo albicaudatus</i>		T
near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May			
Whooping Crane	<i>Grus americana</i>	LE	E
potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties			
Wood Stork	<i>Mycteria americana</i>		T
forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960			

FISHES

Federal Status State Status

American eel	<i>Anguilla rostrata</i>		
coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal			

waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally

Opossum pipefish *Micropis brachyurus* T

brooding adults found in fresh or low salinity waters and young move or are carried into more saline waters after birth; southern coastal areas

Smalltooth sawfish *Pristis pectinata* LE E

different life history stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 ft (10 m); in sheltered bays, on shallow banks, and in estuaries or river mouths; adult sawfish are encountered in various habitat types (mangrove, reef, seagrass, and coral), in varying salinity regimes and temperatures, and at various water depths, feed on a variety of fish species and crustaceans

Texas pipefish *Syngnathus affinis*

Corpus Christi Bay; seagrass beds

INSECTS

Federal Status State Status

Manfreda giant-skipper *Stallingsia maculosus*

most skippers are small and stout-bodied; name derives from fast, erratic flight; at rest most skippers hold front and hind wings at different angles; skipper larvae are smooth, with the head and neck constricted; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk

MAMMALS

Federal Status State Status

Maritime pocket gopher *Geomys personatus maritimus*

fossorial, in deep sandy soils; feeds mostly from within burrow on roots and other plant parts, especially grasses; ecologically important as prey species and in influencing soils, microtopography, habitat heterogeneity, and plant diversity

Ocelot *Leopardus pardalis* LE E

dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November

Plains spotted skunk *Spilogale putorius interrupta*

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Red wolf *Canis rufus* LE E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southern yellow bat *Lasiurus ega* T

associated with trees, such as palm trees (*Sabal mexicana*) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter

West Indian manatee *Trichechus manatus* LE E

Gulf and bay system; opportunistic, aquatic herbivore

White-nosed coati *Nasua narica* T

woodlands, riparian corridors and canyons; most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible

to hunting, trapping, and pet trade

REPTILES		Federal Status	State Status
Atlantic hawksbill sea turtle	<i>Eretmochelys imbricata</i>	LE	E
Gulf and bay system, warm shallow waters especially in rocky marine environments, such as coral reefs and jetties, juveniles found in floating mats of sea plants; feed on sponges, jellyfish, sea urchins, molluscs, and crustaceans, nests April through November			
Green sea turtle	<i>Chelonia mydas</i>	LT	T
Gulf and bay system; shallow water seagrass beds, open water between feeding and nesting areas, barrier island beaches; adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds; nesting behavior extends from March to October, with peak activity in May and June			
Gulf Saltmarsh snake	<i>Nerodia clarkii</i>		
saline flats, coastal bays, and brackish river mouthss			
Keeled earless lizard	<i>Holbrookia propinqua</i>		
coastal dunes, barrier islands, and other sandy areas; eats insects and likely other small invertebrates; eggs laid underground March-September (most May-August)			
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	LE	E
Gulf and bay system, adults stay within the shallow waters of the Gulf of Mexico; feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August			
Leatherback sea turtle	<i>Dermochelys coriacea</i>	LE	E
Gulf and bay systems, and widest ranging open water reptile; omnivorous, shows a preference for jellyfish; in the US portion of their western Atlantic nesting territories, nesting season ranges from March to August			
Loggerhead sea turtle	<i>Caretta caretta</i>	LT	T
Gulf and bay system primarily for juveniles, adults are most pelagic of the sea turtles; omnivorous, shows a preference for mollusks, crustaceans, and coral; nests from April through November			
Spot-tailed earless lizard	<i>Holbrookia lacerata</i>		
central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground			
Texas diamondback terrapin	<i>Malaclemys terrapin littoralis</i>		
coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide			
Texas horned lizard	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			
Texas indigo snake	<i>Drymarchon melanurus erebennus</i>		T
Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter			

Texas scarlet snake	<i>Cemophora coccinea lineri</i>	T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September		
Texas tortoise	<i>Gopherus berlandieri</i>	T
open brush with a grass understory is preferred; open grass and bare ground are avoided; when inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows or under objects; longevity greater than 50 years; active March-November; breeds April-November		

	PLANTS	Federal Status	State Status
Elmendorf's onion	<i>Allium elmendorfii</i>		
Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; flowering March-April, May			
Lila de los llanos	<i>Echeandia chandleri</i>		
most commonly encountered among shrubs or in grassy openings in subtropical thorn shrublands on somewhat saline clays of lomas along Gulf Coast near mouth of Rio Grande; also observed in a few upland coastal prairie remnants on clay soils over the Beaumont Formation at inland sites well to the north and along railroad right-of-ways and cemeteries; flowering (May-) September-December, fruiting October-December			
Mexican mud-plantain	<i>Heteranthera mexicana</i>		
wet clayey soils of resacas and ephemeral wetlands in South Texas and along margins of playas in the Panhandle; flowering June-December, only after sufficient rainfall			
Plains gumweed	<i>Grindelia oolepis</i>		
coastal prairies on heavy clay (blackland) soils, often in depressional areas, sometimes persisting in areas where management (mowing) may maintain or mimic natural prairie disturbance regimes; 'crawfish lands'; on nearly level Victoria clay, Edroy clay, claypan, possibly Greta within Orelia fine sandy loam over the Beaumont Formation, and Harlingen clay; roadsides, railroad rights-of-ways, vacant lots in urban areas, cemeteries; flowering April-December			
Slender rushpea	<i>Hoffmannseggia tenella</i>	LE	E
Texas endemic; coastal prairie grasslands on level uplands and on gentle slopes along drainages, usually in areas of shorter or sparse vegetation; soils often described as Blackland clay, but at some of these sites soils are coarser textured and lighter in color than the typical heavy clay of the coastal prairies; flowering April-November			
South Texas ambrosia	<i>Ambrosia cheiranthifolia</i>	LE	E
grasslands and mesquite-dominated shrublands on various soils ranging from heavy clays to lighter textured sandy loams, mostly over the Beaumont Formation on the Coastal Plain; in modified unplowed sites such as railroad and highway right-of-ways, cemeteries, mowed fields, erosional areas along small creeks; flowering July-November			
Texas windmill-grass	<i>Chloris texensis</i>		
Texas endemic; sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes; flowering in fall			
Welder machaeranthera	<i>Psilactis heterocarpa</i>		

Texas endemic; grasslands , varying from midgrass coastal prairies, and open mesquite-huisache woodlands on nearly level, gray to dark gray clayey to silty soils; known locations mapped on Victoria clay, Edroy clay, Dacosta sandy clay loam over Beaumont and Lissie formations; flowering September-November.

Attachment B
Photographic Log

Client Name:		Site Location:	Project No.
Brine Service Cooperating Parties		Brine Service Company Superfund Site	25012501
Date 10/19/10	Photo No. 1		
Direction Photo Taken:			
East			
Description:		<p>Typical view of the grassy portion of site. Photo was taken from the South Pit Area. The tree line in the background is the East Ditch riparian vegetation. Feature on the left side is the cellular tower.</p>	

Date 10/19/10	Photo No. 2	
Direction Photo Taken:		
Northeast		
Description:		<p>Typical view of the grassy portion of site. Photo was taken from the South Pit Area. The tree line in the background is the East Ditch riparian vegetation at the concrete-lined S-curve portion of the ditch.</p>

Client Name:		Site Location:	Project No.
Brine Service Cooperating Parties		Brine Service Company Superfund Site	25012501
Date 10/19/10	Photo No. 3		
Direction Photo Taken:			
North			
Description:		<p>Typical view of the grassy portion of site. Photo was taken from the South Pit Area. The Goodyear facility that is located above the North Pit, can be seen in the background.</p>	

Date 10/19/10	Photo No. 4	
Direction Photo Taken:		
South		
Description:		<p>Typical view of the grassy portion of site. Photo was taken from the South Pit Area. The heavy equipment repair shop and video store located on can be seen in the background.</p>

Client Name:		Site Location:	Project No.
Brine Service Cooperating Parties		Brine Service Company Superfund Site	25012501
Date 10/19/10	Photo No. 5		
Direction Photo Taken:			
Southeast			
Description:			
Typical view of the grassy portion of site. Photo was taken from the South Pit Area. The tree line in the background is the East Ditch riparian vegetation.			

Date 10/19/10	Photo No. 6	
Direction Photo Taken:		
North		
Description:		
Looking downstream in the intermittent portion of the East Ditch upstream of the concrete lined S-curve.		

Client Name: Brine Service Cooperating Parties		Site Location: Brine Service Company Superfund Site	Project No. 25012501
Date 10/19/10	Photo No. 7		
Direction Photo Taken: South			
Description: Looking upstream in the intermittent portion of the East Ditch upstream of the concrete lined S-curve.			

Date 10/19/10	Photo No. 8		
Direction Photo Taken: Northwest			
Description: View looking downstream of the concrete-line portion of the East Ditch.			

Client Name: Brine Service Cooperating Parties		Site Location: Brine Service Company Superfund Site	Project No. 25012501
Date 10/19/10	Photo No. 9		
Direction Photo Taken:			North
Description: View looking downstream of the concrete-line portion of the East Ditch.			

Date 10/19/10	Photo No. 10		
Direction Photo Taken:			South
Description: View looking upstream of the concrete-line portion of the East Ditch.			

Client Name: Brine Service Cooperating Parties		Site Location: Brine Service Company Superfund Site	Project No. 25012501
Date 10/19/10	Photo No. 11		
Direction Photo Taken: North			
Description: <p>View of the lower reach of East Ditch looking downstream towards Up River Road. Note the debris. Drainage from Up River Road enters the East Ditch at this location as shown by the arrows.</p>			

Date 10/19/10	Photo No. 12		
Direction Photo Taken: South			
Description: <p>View of the lower reach of East Ditch looking upstream.</p>			

Texas Parks and Wildlife Department Annotated County Lists of Rare Species

Nueces County

Updated April 3, 2017

NUECES COUNTY

AMPHIBIANS

		Federal Status	State Status
Black-spotted newt	<i>Notophthalmus meridionalis</i>		T
can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River			

Sheep frog	<i>Hypopachus variolosus</i>		T
predominantly grassland and savanna; moist sites in arid areas			

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
Brown Pelican	<i>Pelecanus occidentalis</i>	DL	
largely coastal and near shore areas, where it roosts and nests on islands and spoil banks			
Eskimo Curlew	<i>Numenius borealis</i>	LE	E
historic; nonbreeding: grasslands, pastures, plowed fields, and less frequently, marshes and mudflats			
Mountain Plover	<i>Charadrius montanus</i>		
breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous			
Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	LE	E
open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.			
Piping Plover	<i>Charadrius melanotos</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			

NUECES COUNTY**BIRDS**

Federal Status State Status

Red Knot*Calidris canutus rufa*

T

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax* spp.) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Reddish Egret*Egretta rufescens*

T

resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear

Sennett's Hooded Oriole*Icterus cucullatus sennetti*

often builds nests in and of Spanish moss (*Tillandsia usneoides*); feeds on invertebrates, fruit, and nectar; breeding March to August

Snowy Plover*Charadrius alexandrinus*

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Sooty Tern*Sterna fuscata*

T

predominately 'on the wing'; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July

Sprague's Pipit*Anthus spragueii*

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Texas Botteri's Sparrow*Aimophila botterii texana*

T

grassland and short-grass plains with scattered bushes or shrubs, sagebrush, mesquite, or yucca; nests on ground of low clump of grasses

Western Burrowing Owl*Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

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NUECES COUNTY

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	brooding adults found in fresh or low salinity waters and young move or are carried into more saline waters after birth; southern coastal areas		
Smalltooth sawfish	<i>Pristis pectinata</i>	LE	E
	different life history stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 ft (10 m); in sheltered bays, on shallow banks, and in estuaries or river mouths; adult sawfish are encountered in various habitat types (mangrove, reef, seagrass, and coral), in varying salinity regimes and temperatures, and at various water depths, feed on a variety of fish species and crustaceans		
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	Corpus Christi Bay; seagrass beds		

NUECES COUNTY**INSECTS**

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Ocelot*Leopardus pardalis*

LE

E

dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November

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Red wolf*Canis rufus*

LE

E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southern yellow bat*Lasiurus ega*

T

associated with trees, such as palm trees (*Sabal mexicana*) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter

West Indian manatee*Trichechus manatus*

LE

E

Gulf and bay system; opportunistic, aquatic herbivore

White-nosed coati*Nasua narica*

T

woodlands, riparian corridors and canyons; most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible to hunting, trapping, and pet trade

REPTILES

Federal Status State Status

Atlantic hawksbill sea turtle*Eretmochelys imbricata*

LE

E

Gulf and bay system, warm shallow waters especially in rocky marine environments, such as coral reefs and jetties, juveniles found in floating mats of sea plants; feed on sponges, jellyfish, sea urchins, molluscs, and crustaceans, nests April through November

NUECES COUNTY**REPTILES**

Federal Status State Status

Green sea turtle*Chelonia mydas*

LT

T

Gulf and bay system; shallow water seagrass beds, open water between feeding and nesting areas, barrier island beaches; adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds; nesting behavior extends from March to October, with peak activity in May and June

Keeled earless lizard*Holbrookia propinqua*

coastal dunes, barrier islands, and other sandy areas; eats insects and likely other small invertebrates; eggs laid underground March-September (most May-August)

Kemp's Ridley sea turtle*Lepidochelys kempii*

LE

E

Gulf and bay system, adults stay within the shallow waters of the Gulf of Mexico; feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August

Leatherback sea turtle*Dermochelys coriacea*

LE

E

Gulf and bay systems, and widest ranging open water reptile; omnivorous, shows a preference for jellyfish; in the US portion of their western Atlantic nesting territories, nesting season ranges from March to August

Loggerhead sea turtle*Caretta caretta*

LT

T

Gulf and bay system primarily for juveniles, adults are most pelagic of the sea turtles; omnivorous, shows a preference for mollusks, crustaceans, and coral; nests from April through November

Spot-tailed earless lizard*Holbrookia lacerata*

central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground

Texas diamondback terrapin*Malaclemys terrapin littoralis*

coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide

Texas horned lizard*Phrynosoma cornutum*

T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

Texas indigo snake*Drymarchon melanurus erebennus*

T

Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter

Texas scarlet snake*Cemophora coccinea lineri*

T

mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September

Texas tortoise*Gopherus berlandieri*

T

NUECES COUNTY

REPTILES

	Federal Status	State Status
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open brush with a grass understory is preferred; open grass and bare ground are avoided; when inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows or under objects; longevity greater than 50 years; active March-November; breeds April-November

PLANTS

	Federal Status	State Status
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Buckley's spiderwort	<i>Tradescantia buckleyi</i>	
Occurs on sandy loam or clay soils in grasslands or shrublands underlain by the Beaumont Formation.		
Cory's croton	<i>Croton coryi</i>	
GLOBAL RANK: G3; Grasslands and woodland openings on barrier islands and coastal sands of South Texas, inland on South Texas Sand Sheet; Annual; Flowering July-Oct; Fruiting July-Nov		
Drummond's rushpea	<i>Hoffmannseggia drummondii</i>	
GLOBAL RANK: G4; Open areas on sandy clay; Perennial		
Elmendorf's onion	<i>Allium elmendorfii</i>	
Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; Perennial; Flowering March-April, May		
Jones' nailwort	<i>Paronychia jonesii</i>	
GLOBAL RANK: G3; Occurs in early successional open areas on deep well-drained sand; Biennial Annual; Flowering March-Nov; Fruiting April-Nov		
Large selenia	<i>Selenia grandis</i>	
GLOBAL RANK: G4; Occurs in seasonally wet clayey soils in open areas; Annual; Flowering Jan-April; Fruiting Feb-April		
Lila de los llanos	<i>Echeandia chandleri</i>	
most commonly encountered among shrubs or in grassy openings in subtropical thorn shrublands on somewhat saline clays of lomas along Gulf Coast near mouth of Rio Grande; also observed in a few upland coastal prairie remnants on clay soils over the Beaumont Formation at inland sites well to the north and along railroad right-of-ways and cemeteries; flowering (May-) September-December, fruiting October-December		
Mexican mud-plantain	<i>Heteranthera mexicana</i>	
wet clayey soils of resacas and ephemeral wetlands in South Texas and along margins of playas in the Panhandle; flowering June-December, only after sufficient rainfall		

NUECES COUNTY

PLANTS

Federal Status	State Status
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Plains gumweed
Grindelia oolepis

coastal prairies on heavy clay (blackland) soils, often in depressional areas, sometimes persisting in areas where management (mowing) may maintain or mimic natural prairie disturbance regimes; 'crawfish lands'; on nearly level Victoria clay, Edroy clay, claypan, possibly Greta within Orelia fine sandy loam over the Beaumont Formation, and Harlingen clay; roadsides, railroad rights-of-ways, vacant lots in urban areas, cemeteries; flowering April-December

Sand Brazos mint
Brazoria arenaria

GLOBAL RANK: G3; Sandy areas in South Texas; Annual; Flowering/Fruiting March-April

Slender rushpea
Hoffmannseggia tenella

LE

E

Texas endemic; coastal prairie grasslands on level uplands and on gentle slopes along drainages, usually in areas of shorter or sparse vegetation; soils often described as Blackland clay, but at some of these sites soils are coarser textured and lighter in color than the typical heavy clay of the coastal prairies; flowering April-November

South Texas ambrosia
Ambrosia cheiranthifolia

LE

E

Grasslands and mesquite-dominated shrublands on various soils ranging from heavy clays to lighter textured sandy loams, mostly over the Beaumont Formation on the Coastal Plain; in modified unplowed sites such as railroad and highway right-of-ways, cemeteries, mowed fields, erosional areas along small creeks; Perennial; Flowering July-November

South Texas spikesedge
Eleocharis austrotexana

GLOBAL RANK: G3; Occurring in miscellaneous wetlands at scattered locations on the coastal plain; Perennial; Flowering/Fruiting Sept

Texas peachbush
Prunus texana

GLOBAL RANK: G3; Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-Jun

Texas stonecrop
Lenophyllum texanum

GLOBAL RANK: G3; Found in shrublands on clay dunes (lomas) at the mouth of the Rio Grande and on xeric calcareous rock outcrops at scattered inland sites; Perennial; Flowering/Fruiting Nov-Feb

Texas windmill-grass
Chloris texensis

Texas endemic; sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes; flowering in fall

Tree dodder
Cuscuta exaltata

GLOBAL RANK: G3; Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Velvet spurge
Euphorbia innocua

GLOBAL RANK: G3; Open or brushy areas on coastal sands and the South Texas Sand Sheet; Perennial; Flowering Sept-April; Fruiting Nov-July

NUECES COUNTY**PLANTS**

Federal Status

State Status

Welder machaeranthera*Psilactis heterocarpa*

Texas endemic; grasslands , varying from midgrass coastal prairies, and open mesquite-huisache woodlands on nearly level, gray to dark gray clayey to silty soils; known locations mapped on Victoria clay, Edroy clay, Dacosta sandy clay loam over Beaumont and Lissie formations; flowering September-November

Wright's trichocoronis*Trichocoronis wrightii var. wrightii*

GLOBAL RANK: G4T3; Most records from Texas are historical, perhaps indicating a decline as a result of alteration of wetland habitats; Annual; Flowering Feb-Oct; Fruiting Feb-Sept

Appendix B – Sample Data Summary Tables

Appendix B
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Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location			ESSB10 0-0.5 ft	ESSS01 0-0.5 ft	ESSS02 0-0.5 ft	ESSS03 0-0.5 ft	ESSS04 0-0.5 ft	ESSS05 0-0.5 ft	ESSS05 0-0.5 ft	ESSS12 0-0.5 ft	ESSB11 0-0.5 ft	SPSS01 0-0.5 ft	SPSS02 0-0.5 ft	SPSS03 0-0.5 ft	SPSS03 0-0.5 ft	SPSS04 0-0.5 ft	SPSS04 0-0.5 ft	SPSS05 0-0.5 ft	SPSS05 0-0.5 ft	SPSS06 0-0.5 ft	SPSS06 0-0.5 ft	SPSS07 0-0.5 ft	SPSS07 0-0.5 ft	SPSS08 0-0.5 ft	WSS01 0-0.5 ft	WSS02 0-0.5 ft	WSS03 0-0.5 ft	WSS04 0-0.5 ft	
Sample Depth	1/4/2012	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	1/4/2012	1/4/2012	10/14/2010	10/13/2010	10/14/2010	10/14/2010	10/14/2010	10/14/2010	10/13/2010	10/13/2010	10/14/2010	10/14/2010	10/13/2010	10/14/2010	10/8/2010	10/7/2010	10/8/2010	10/7/2010		
Analyte	CAS No.	Units																											
METALS																													
Aluminum#	7429-90-5	mg/kg	7280	4890	6540	10700	14700	7780	8790	7800	4090	5700	5660	5780	6400	5010	1410	6340	5620	6510	10500	11400	3540	11400					
Antimony	7440-36-0	mg/kg	<0.2	<0.25	<0.3	<0.25	<0.28	<0.26	<0.27	<0.21	<0.19	<2.6	<2.4	<2.5	<2.4	<2.5	<2.7	<2.3	<2.8	<0.27	<0.28	<0.27	<0.27	<0.25					
Arsenic	7440-38-2	mg/kg	2.85	2.35	2.61	6.68	5.32	7.03	6.6	2.54	1.87	2.44 J	13.6	2.25 J	2.2 J	2.14 J	0.766 J	11.2	2.13 J	1.81 J	3.59	4.6	2.59	2.58					
Barium#	7440-39-3	mg/kg	203	156	467	1180	301	1070	1000	224	206	290	305	298	119	544	280	263	1000	551	133	335							
Beryllium	7440-41-7	mg/kg	0.522	0.272 J	0.406 J	0.531	0.811	0.521	0.56	0.563	0.303 J	0.632 J	0.609 J	0.596 J	0.647 J	0.531 J	<0.49	0.775 J	0.663 J	0.807 J	0.554	0.476 J	0.182 J	0.506					
Cadmium#	7440-43-9	mg/kg	0.192 J	0.126 J	0.214 J	1.78	0.4 J	5.69	5.73	0.147 J	0.117 J	<0.41	<0.39	0.757 J	0.739 J	0.419 J	6.99	1.28 J	<0.44	0.343 J	0.397 J	0.589	0.982						
Chromium#	7440-47-3	mg/kg	5.01	3.03	4.23	178	8.38	34.8	31.4	5.86	3.47	7.45	6.06	17.6	20.5	88.1	65.3	22.8	26.3	7.07	10.2	12.8	11.6	21					
Cobalt	7440-48-4	mg/kg	3.98	2.24	2.94	6.51	5.79	5.42	4.99	3.48	2.28	2.42 J	2.18 J	2.46 J	2.74 J	2.21 J	0.434 J	6.93	2.39 J	3.16 J	3.86	3.76	1.84	3.19					
Copper#	7440-50-8	mg/kg	6.01	2.91	5.53	70.3	8.72	39.9	37.4	6.04	4.19	8.56	10.2	10.6	10.9	15.9	6.56	105	14.9	5.55	13.1	10.9	14.3	11.3					
Lead#	7439-92-1	mg/kg	10.4	5.14	10.5	143	29.7	114	100	9.33	7.93	19.1	13.9	65.1	61.1	253	277	137	61.4	11 JL	58.4	39.9	202	52.3					
Manganese#	7439-96-5	mg/kg	220	121	180	213	324	286	120	116	193	177	180	120	55.4	490	157	153	229	238	129	188							
Nickel#	7440-02-0	mg/kg	5.51	3.15	4.76	9.27	9	7.69	7.34	5.31	3.31	4.92 J	6.34	7.09	7.9	4.18 J	2.71 J	12.2	13.6	4.79 J	7.2	7.56	7.13	10.1					
Selenium#	7782-49-2	mg/kg	1.09	<0.25	<0.3	0.571	0.503 J	1.7	1.42	0.53 U	<2.6	<2.4	<2.4	<2.4	<2.4	<2.4	<2.5	<2.7	<2.3	<2.8	0.466 J	0.394 J	<0.27	0.395 J					
Silver#	7440-22-4	mg/kg	<0.081	<0.041	<0.048	0.378 J	<0.44	0.593	0.611	<0.083	<0.076	<0.41	<0.39	<0.4	<0.39	<0.39	<0.44	<0.36	<0.44	<0.043	<0.045	<0.043	<0.043	<0.043	0.097 J				
Thallium	7440-28-0	mg/kg	0.105 U	0.174 J	0.15 J	0.167 J	0.226 J	0.158 J	0.164 J	0.188 U	0.0739 U	<0.73	<0.68	<0.69	<0.68	<0.69	<0.77	<0.63	0.214 U	0.232 U	0.111 U	0.161 U							
Vanadium#	7440-62-2	mg/kg	13.4	9.89	10.9	17.1	20.5	15.4	15.5	9.62	6.99	11.8	14.8	10.5	11.9	7.44	4.74 J	14.2	13.5	13.9	16.8	17	8.81	16.2					
Zinc#	7440-66-6	mg/kg	23.9	12.8	25.9	383	42.5	811	832	18.3	88.1	44.7	423																

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			ESSB10 0-0.5 ft	ESSS01 0-0.5 ft	ESSS02 0-0.5 ft	ESSS03 0-0.5 ft	ESSS04 0-0.5 ft	ESSS05 0-0.5 ft	ESSS05 0-0.5 ft	ESSS12 0-0.5 ft	ESSB11 0-0.5 ft	SPSS01 0-0.5 ft	SPSS02 0-0.5 ft	SPSS03 0-0.5 ft	SPSS03 0-0.5 ft	SPSS04 0-0.5 ft	SPSS05 0-0.5 ft	SPSS05 0-0.5 ft	SPSS06 0-0.5 ft	SPSS07 0-0.5 ft	SPSS08 0-0.5 ft	WSS01 0-0.5 ft	WSS02 0-0.5 ft	WSS03 0-0.5 ft	WSS04 0-0.5 ft
Analyte	CAS No.	Units																							
Bromodichloromethane	75-27-4	mg/kg	<0.00059	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00066	<0.00061	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00067	<0.00051	<0.00045
Bromoform	75-25-2	mg/kg	<0.00069	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00077	<0.00071	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Bromomethane	74-83-9	mg/kg	<0.0099	<0.00099	<0.0013	<0.0011	<0.0012	<0.0014	<0.0013	<0.0018	<0.0016	<0.0011	<0.00092	<0.0012	<0.0014	<0.0011	<0.0011	<0.0013	<0.00099	<0.0012	<0.0011	<0.0013	<0.001	<0.0009	
Carbon disulfide	75-15-0	mg/kg	<0.0016	<0.00099	<0.0013	<0.0011	<0.0012	<0.0014	<0.0013	<0.0018	<0.0016	<0.0011	<0.00092	<0.0012	<0.0014	<0.0011	<0.0011	<0.0013	<0.00099	<0.0012	<0.0011	<0.0013	<0.001	<0.0009	
Carbon tetrachloride	56-23-5	mg/kg	<0.0012	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0013	<0.0012	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Chlorobenzene	108-90-7	mg/kg	<0.0049	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00055	<0.00051	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Chloroethane	75-00-3	mg/kg	<0.0099	<0.00099	<0.0013	<0.0012	<0.0014	<0.0013	<0.0011	<0.001	<0.00092	<0.0012	<0.0014	<0.0011	<0.0011	<0.0013	<0.00099	<0.0012	<0.0011	<0.0013	<0.001	<0.0009			
Chloroform	67-66-3	mg/kg	<0.0018	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.002	<0.0018	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Chlormethane	74-87-3	mg/kg	<0.0089	<0.00099	<0.0013	<0.0011	<0.0012	<0.0014	<0.0013	<0.00099	<0.00091	<0.0011	<0.00092	<0.0012	<0.0014	<0.0011	<0.0013	<0.00099	<0.0012	<0.0011	<0.0013	<0.001	<0.0009		
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.0015	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00055	<0.00051	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.0049	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00055	<0.00051	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Cyclohexane	110-82-7	mg/kg	<0.0012	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0013	<0.0012	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Dibromochloromethane	124-48-1	mg/kg	<0.0009	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00055	<0.00051	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Dichlorodifluoromethane	75-71-8	mg/kg	<0.0018	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.002	<0.0018	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Ethylbenzene	100-41-4	mg/kg	<0.0089	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.00099	<0.00091	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Isopropylbenzene	98-82-8	mg/kg	<0.0099	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0011	<0.001	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Methyl acetate	79-20-9	mg/kg	<0.0099	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0011	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045		
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.019	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0021	<0.0019	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045	
Methylcyclohexane	108-87-2	mg/kg	<0.0015	<0.0005	<0.00063	<0.00055	<0.00059	<0.0007	<0.00066	<0.0017	<0.00053	<0.00046	<0.00061	<0.00069	<0.00056	<0.00053	<0.00064	<0.00049	<0.00059	<0.00055	<0.00067	<0.00051	<0.00045		
Methylene chloride	75-09-2	mg/kg	<0.0025	0.0022 U	0.002 U																				

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			ESSB10 0-0.5 ft	ESSS01 0-0.5 ft	ESSS02 0-0.5 ft	ESSS03 0-0.5 ft	ESSS04 0-0.5 ft	ESSS05 0-0.5 ft	ESSS05 0-0.5 ft	ESSS12 0-0.5 ft	ESSB11 0-0.5 ft	SPSS01 0-0.5 ft	SPSS02 0-0.5 ft	SPSS03 0-0.5 ft	SPSS03 0-0.5 ft	SPSS04 0-0.5 ft	SPSS05 0-0.5 ft	SPSS06 0-0.5 ft	SPSS07 0-0.5 ft	SPSS08 0-0.5 ft	WSS01 0-0.5 ft	WSS02 0-0.5 ft	WSS03 0-0.5 ft	WSS04 0-0.5 ft
Analyte	CAS No.	Units																						
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.0019	<0.0027	<0.0031	<0.026	<0.0028	<0.028	<0.019	<0.0017	<0.013	<0.026	<0.013	<0.0026	<0.0025 JL	<0.0025	<0.0027	<0.0025	<0.0028 JL	<0.027	<0.028	<0.027	<0.027	<0.0026
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.0019	<0.0031	<0.0036	<0.031	<0.0033	<0.0033	<0.033	<0.0019	<0.0017	<0.016	<0.03	<0.015	<0.0031	<0.0029 JL	<0.0029	<0.0032	<0.0029	<0.0032	<0.032	<0.033	<0.032	<0.003
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.0019	<0.003	<0.0034	<0.03	<0.0032	<0.0032	<0.031	<0.0019	<0.0017	<0.015	<0.029	<0.015	<0.003	<0.0028 JL	<0.0028	<0.003	<0.0028	<0.0031	<0.031	<0.032	<0.03	<0.0029
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	0.0051 U	<0.0073	0.011 U	<0.073	0.017 U	<0.0077	<0.077	0.011	0.0088 U	<0.037	<0.071	0.052 U	0.037 U	0.03 UJL	0.01 U	0.0097	0.0092	0.008 U	0.091 U	<0.078	<0.074	<0.0072
Butyl benzyl phthalate	85-68-7	mg/kg	<0.0032	<0.0028	<0.0032	<0.028	<0.0029	<0.0029	<0.029	0.0054 J	0.0047 J	0.023 J	0.05 J	<0.014	0.041	<0.0026 JL	<0.0026	<0.0028	<0.0026	<0.0029	<0.028	<0.03	<0.028	<0.0027
Caprolactam	105-60-2	mg/kg	<0.0023	<0.0027	<0.0031	<0.026	<0.0028	<0.0028	<0.028	<0.0023	<0.0022	<0.013	<0.026	<0.013	<0.0026	<0.0025 JL	<0.0025	<0.0027	<0.0025	<0.0028 JL	<0.027	<0.028	<0.027	<0.0026
Carbazole#	86-74-8	mg/kg	0.003 J	<0.0024	<0.0028	<0.024	0.0046 J	<0.0026	<0.026	0.0024 J	0.0022 J	0.019 J	<0.024	0.016 J	0.011	0.0032 JL	0.0097	0.0066 J	0.0089	0.0052 J	<0.025	<0.026	<0.025	0.0034 J
Chrysene	218-01-9	mg/kg	0.014	<0.0032	0.011	0.25	0.032	0.027 J	0.13 J	0.0088	0.014	0.15	0.047 J	0.12	0.12	0.061 JL	0.051	0.052	0.05	0.02	0.11	0.13	0.021	
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.0038 J	<0.0024	<0.0028	0.13	<0.0026	<0.0026	0.0042 J	0.0036 J	<0.012	<0.024	<0.012	<0.0024	<0.0023 JL	<0.0023	<0.0025	0.0093	<0.0025	<0.025	<0.026	<0.025	<0.0024	
Dibenzofuran#	132-64-9	mg/kg	<0.0019	<0.0024	<0.0028	0.075	<0.0026	0.0036 J	<0.026	<0.0019	<0.0017	<0.012	<0.024	<0.012	0.0026 J	<0.0023 JL	0.0066 J	<0.0025	0.0038 J	<0.0025	<0.025	<0.026	<0.0024	
Diethyl phthalate	84-66-2	mg/kg	<0.0019	<0.0037	<0.0042	<0.036	<0.0039	<0.0039	<0.038	0.0021 U	<0.0017	<0.018	<0.036	<0.018	<0.0036	<0.0034 JL	<0.0034	<0.0037	<0.0034	<0.0038	<0.037	<0.039	<0.0036	
Dimethyl phthalate	131-11-3	mg/kg	<0.0023	<0.0027	<0.0031	<0.026	<0.0028	<0.0028	<0.028	<0.0023	<0.0022	<0.013	<0.026	<0.013	<0.0026	<0.0025 JL	<0.0025	<0.0027	<0.0028	<0.028	<0.027	<0.027	<0.0026	
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0023	<0.0028	<0.0032	<0.028	0.0037 U	<0.0029	<0.029	0.0065 J	0.004 U	<0.014	<0.027	0.018 U	0.0047 U	<0.0026	<0.0028	<0.0026	<0.0029	<0.028	<0.03	<0.028	<0.0027	
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0023	<0.0032	<0.0037	<0.032	<0.0034	<0.0034	<0.034	<0.0023	<0.0022	<0.016	<0.031	<0.016	<0.0032	<0.003 JL	<0.003	<0.0033	<0.0033	<0.033	<0.034	<0.033	<0.0031	
Fluoranthene	206-44-0	mg/kg	0.02	0.0031 J	0.02	0.091	0.047	0.034 J	0.18 J	0.015	0.024	0.26	0.056 J	0.18	0.19	0.074 JL	0.13	0.076	0.11	0.043	0.16	0.19	0.042	
Fluorene	86-73-7	mg/kg	<0.0019	<0.0024	<0.0028	<0.024	<0.0026	<0.0026	<0.026	<0.0019	<0.0017	<0.012	<0.024	<0.012	0.0049 J	<0.0023 JL	0.007	<0.0025	0.0031 J	<0.0025	<0.025	<0.026	<0.0024	
Hexachlorobenzene	118-74-1	mg/kg	<0.0019	<0.0029	<0.0033	<0.029	<0.0031	<0.003	<0.03	<0.0019	<0.0017	<0.014	<0.028	<0.014	<0.028	<0.0027 JL	<0.0027	<0.0029	<0.0027	<0.03	<0.029	<0.029	<0.0028	
Hexachlorobutadiene	87-68-3	mg/kg	<0.0019	<0.0049	<0.0056	<0.048	<0.0052	<0.0051	<0.051	<0.0019	<0.0017	<0.024	<0.047	<0.024	<0.047	<0.0048	<0.0046 JL	<0.0045	<0.005	<0.0045	<0.005	<0.05	<0.05	<0.0048
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0019	<0.004	<0.0046	<0.04	<0.0042	<0.0042	<0.042	<0.0019	<0.0017	<0.02	<0.039	<0.02	<0.039	<0.0037 JL	<0.0037	<0.0041	<0.0037	<0.0041 JL	<0.041	<0.043	<0.041	<0.0039
Hexachloroethane	67-72-1	mg/kg	<0.0019	<0.0043	<0.005	<0.043	<0.0046	<0.0046	<0.045	<0.0019	<0.0017	<0.022	<0.042	<0.021	<0.043	<0.0041 JL	<0.004	<0.0044	<0.004	<0.0045	<0.044	<0.046	<0.044	<0.0042
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.0095	<0.0039	0.0094	0.11	0.025	0.021	<0.041	0.0081	0.013	0.091</b												

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location			WSS09 0-0.5 ft	E S S B 0 1 1-2 ft	E S S B 0 2 1-2 ft	E S S B 0 3 1-2 ft	E S S B 0 3 1-2 ft	E S S B 0 4 1-2 ft	E S S B 0 5 1-2 ft	E S S B 0 6 1-2 ft	E S S B 0 7 1-2 ft	E S S B 0 8 1-2 ft	E S S B 1 0 1-2 ft	E S S B 1 1 1-2 ft	E S S B 1 2 1-2 ft	E S S B 1 3 1-2 ft	E S S B 1 4 1-2 ft	E S S B 1 5 1-2 ft	E S S S 1 3 1-2 ft	S P S B 0 1 1-2 ft	S P S B 0 2 1-2 ft	S P S B 0 3 1-2 ft	S P S B 0 4 1-2 ft	S P S B 0 5 1-2 ft	S P S B 0 6 1-2 ft	S P S B 0 7 1-2 ft
Sample Depth	12/14/2011	11/4/2010	11/5/2010	12/9/2010	12/9/2010	11/5/2010	11/4/2010	11/3/2010	12/8/2010	11/4/2010	1/4/2012	1/4/2012	1/4/2012	3/6/2012	3/6/2012	3/7/2012	12/4/2012	12/2/2010	12/2/2010	12/1/2010	12/2/2010	12/3/2010	12/3/2010	12/1/2010		
Analyte	CAS No.	Units																								
METALS																										
Aluminum#	7449-90-5	mg/kg	---	13000	12800	17700	13900	9990	14000	7360	11400	10600	6720	9070	9390	6550	4020	7510	---	7970	19500	10600	17300	18100	15900	12500
Antimony	7440-36-0	mg/kg	---	<0.28	<0.27	<1.3	<1.3	0.377 J	<0.27	<0.27	<0.3	<0.22	<0.2	<0.22	<0.2	0.23 J	0.223 J	---	<0.27	<0.28	<0.26	<0.28	0.365 J	1.06	<0.29	
Arsenic	7440-38-2	mg/kg	1.53	3	5.19	10.2	10.4	14.4	4.91	6.43	4.08	6.2	2.75	3.45	2.83	3.64	5.81	4.24	4.22	2.13	4.85	3.92	8.74	7.3	5.28	4
Barium#	7440-39-3	mg/kg	---	112	216	1240	1140	225	2070	249	582	210	1310	1140	161	228	1220	282	---	488	799	181	1430	609	2220	176
Beryllium	7440-41-7	mg/kg	---	0.556	0.6	0.579 J	0.524 J	0.553	0.483 J	0.397 J	0.592	0.709	0.624	0.679	0.407 J	0.255 J	0.481 J	---	0.47 J	0.635	0.496 J	0.53 J	0.673	0.444 J	0.679	
Cadmium#	7440-43-9	mg/kg	---	0.177 J	0.23 J	13.1	13	10.7	0.449 J	8.19	0.737	0.193 J	0.311 J	0.456 J	0.166 J	0.207 J	0.508 J	0.303 J	---	0.186 J	0.385 J	0.214 J	0.814	9.07	0.696	0.261 J
Chromium#	7440-47-3	mg/kg	---	6.9	8.23	216	234	6.85	92.1	5.99	7.29	8.76	5.83	7.35	6.01	3.79	15.8	7.27	---	7.6	50	14.6	121	21	77.5	8.55
Cobalt	7440-48-4	mg/kg	---	3.97	8.33	8.61	7.68	5.32	5.7	2.94	4.74	5.15	3.26	4.61	4.63	2.35	2.25	3.58	---	2.92	5.13	3.46	7.2	4.47	4.78	4.73
Copper#	7440-50-8	mg/kg	---	7.03	8.39	123	114	234	54.2	37.6	8.36	7.11	13.7	12.1	5.92	3.87	16.1	9.77	---	17.2	19.2	8.16	89	40.3	63.8	9.4
Lead#	7439-92-1	mg/kg	---	11	25.7	232	254	151	81.8	101	17.2	11.7	84.8	43.5	8.73	6.29	127	32.2	---	23.2	87.9	20.6	118	124	142	9.45
Manganese#	7439-96-5	mg/kg	---	289	374	324	297	377	164	216	317	311	156	256	297	76.9	149	202	---	177	313	193	359	251	270	283
Nickel#	7440-02-0	mg/kg	---	7.23	9.32	12.9	13	9.93	7.28	5.16	6.46	8.22	5.55	6.95	6.54	2.94	5.48	5.87	---	5.84	10.4	6.31	17.5	7.59	27.8	8.39
Selenium#	7782-49-2	mg/kg	---	0.765	0.82	1.9 J	2.11 J	1.74	0.991	3.77	0.956	1.51	0.998	1.43	1.32	0.656	0.268 J	0.838	---	0.623	0.666	0.423 J	0.634	1.6	1.67	0.656
Silver#	7440-22-4	mg/kg	---	<0.044	<0.043	1.47 J	1.13 J	0.647	0.217 J	0.692 J	0.0793 J	<0.048 JL	<0.086	<0.081	<0.087	<0.08	<0.086	<0.085	---	0.0706 J	0.147 J	0.0431 J	0.166 J	0.909	0.212 J	0.0549 J
Thallium	7440-28-0	mg/kg	---	0.166 J	0.174 J	<0.37	<0.37	0.22 J	0.176 J	0.137 J	0.133 U	0.237 J	0.158 U	0.136 U	0.161 U	0.163 J	0.0793 J	0.127 J	---	0.144 J	0.166 J	0.13 J	0.165 J	0.221 J	0.148 J	0.162 J
Vanadium#	7440-62-2	mg/kg	---	10.4	22.1	27.7	25.4	15.7	13.6	11.8	14.9	19.6	11.7	11.1	13.8	12.5	15.7	---	12.2	18.7	15.6	21.9	21.2	17.7	19.3	
Zinc#	7440-66-6	mg/kg	---	23.3	26.6	1960	1760	2120	115	551	73.2	30.4	72.9	64.5	18.1	12.9	164	55.5	---	32.2	73.4	61.1	157	1160	190	58.3
Mercury#	7439-97-6	mg/kg	0.459	0.0149	0.0159	2.95	3.77	4.6	2.22	23	2.81	0.0365	0.0174	0.0185	0.0244	0.00183 J	0.0264	0.00405 J	0.0603	0.0122	0.109	0.807	0.0479	2.2	0.581	0.108
Cyanide#	57-12-5	mg/kg	---	<0.7	<0.71	<0.71	<0.59	<0.64	<0.66	2.34	<0.65	<0.74	1.03 J	0.722 J	1.2 J	<0.68	<0.7	<0.7	---	<0.68	<0.68	<0.69	<0.76	<0.72	<0.68	<0.72
PESTICIDES and PCBs																										
4,4'-DDD#	72-54-8	mg/kg	---	<0.00059	<0.003	0.075	0.067	<0.0027	0.024 J	<0.0058	<0.0057	<0.00062	<0.00057	<0.00056	<0.0006	<0.00057	<0.0012	<0.00059	---	<0.0029	<0.0058	<0.0059	<0.064	<0.003	0.035 J	<0.003
4,4'-DDE#	72-55-9	mg/kg	---	<0.00059	<0.003	<0.0059	<0.0058	<0.0027	<0.0028	<0.0058	<0.0057	<0.00062	<0.00057	<0.00056	<0.0006</td											

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location			WSS09 0-0.5 ft	E S S B 0 1 1-2 ft	E S S B 0 2 1-2 ft	E S S B 0 3 1-2 ft	E S S B 0 3 1-2 ft	E S S B 0 4 1-2 ft	E S S B 0 5 1-2 ft	E S S B 0 6 1-2 ft	E S S B 0 7 1-2 ft	E S S B 0 8 1-2 ft	E S S B 1 0 1-2 ft	E S S B 1 1 1-2 ft	E S S B 1 2 1-2 ft	E S S B 1 3 1-2 ft	E S S B 1 4 1-2 ft	E S S B 1 5 1-2 ft	E S S S 1 3 1-2 ft	S P S B 0 1 1-2 ft	S P S B 0 2 1-2 ft	S P S B 0 3 1-2 ft	S P S B 0 4 1-2 ft	S P S B 0 5 1-2 ft	S P S B 0 6 1-2 ft	S P S B 0 7 1-2 ft
Sample Depth	CAS No.	Units	12/14/2011	11/4/2010	11/5/2010	12/9/2010	12/9/2010	11/5/2010	11/4/2010	11/3/2010	12/8/2010	11/4/2010	1/4/2012	1/4/2012	1/4/2012	3/6/2012	3/6/2012	3/7/2012	12/4/2012	12/2/2010	12/2/2010	12/1/2010	12/2/2010	12/3/2010	12/1/2010	
Analyte																										
Bromodichloromethane	75-27-4	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00057	<0.00063	<0.00053	<0.00054	<0.00058	<0.00056	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046
Bromoform	75-25-2	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00066	<0.00074	<0.00062	<0.00063	<0.00068	<0.00065	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046
Bromomethane	74-83-9	mg/kg	---	<0.0011	<0.00095	<0.001	<0.0011	<0.00093	<0.0011	<0.001	<0.00087	<0.00094	<0.0011	<0.00088	<0.0009	<0.00097	<0.00093	---	<0.00086	<0.00085	<0.00095	<0.001	<0.00089	<0.001	<0.00091	
Carbon disulfide	75-15-0	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0011	<0.0013	<0.0011	<0.0012	<0.0011	---	<0.00086	<0.00085	<0.00095	<0.001	<0.00089	<0.001	<0.00091	
Carbon tetrachloride	56-23-5	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0011	<0.0013	<0.0011	<0.0012	<0.0011	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046	
Chlorobenzene	108-90-7	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00047	<0.00053	<0.00044	<0.00045	<0.00049	<0.00047	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046
Chloroethane	75-00-3	mg/kg	---	<0.0011	<0.00095	<0.001	<0.0011	<0.00093	<0.0011	<0.001	<0.00087	<0.00094	<0.0011	<0.00088	<0.0009	<0.00097	<0.00093	---	<0.00086	<0.00085	<0.00095	<0.001	<0.00089	<0.001	<0.00091	
Chloroform	67-66-3	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0017	<0.0019	<0.0016	<0.0016	<0.0017	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046	
Chloromethane	74-87-3	mg/kg	---	<0.0011	<0.00095	<0.001	<0.0011	<0.00093	<0.0011	<0.001	<0.00087	<0.00095	<0.00079	<0.00081	<0.00087	<0.00084	---	<0.00086	<0.00085	<0.00095	<0.001	<0.00089	<0.001	<0.00091		
cis-1,2-Dichloroethene	156-59-2	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0014	<0.0016	<0.0013	<0.0014	<0.0015	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046	
cis-1,3-Dichloropropene	10061-01-5	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00047	<0.00053	<0.00044	<0.00045	<0.00049	<0.00047	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046
Cyclohexane	110-82-7	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0011	<0.0013	<0.0011	<0.0012	<0.0011	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046	
Dibromoethane	124-48-1	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00047	<0.00053	<0.00044	<0.00045	<0.00049	<0.00047	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046
Dichlorodifluoromethane	75-71-8	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.0017	<0.0019	<0.0016	<0.0017	<0.0017	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.00045	<0.00052	<0.00046	
Ethylbenzene	100-41-4	mg/kg	---	<0.00053	<0.00047	0.022 J	0.031 J	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00085	<0.00095	<0.00079	<0.00081	<0.00087	<0.00084	---	<0.00043	<0.00042	0.046 J	0.044 J	<0.00045	<0.00052	0.022 J
Isopropylbenzene	98-82-8	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00094	<0.0011	<0.00088	<0.0009	<0.00097	<0.00093	---	<0.00043	<0.00042	0.012 J	0.046 J	0.056	0.062	<0.00046
Methyl acetate	79-20-9	mg/kg	---	<0.00053	<0.00047	<0.00052	<0.00054	<0.00059	<0.00047	<0.00053	<0.00051	<0.00044	<0.00094	<0.0011	<0.00088	<0.0009	<0.00097	<0.00093	---	<0.00043	<0.00042	<0.00048	<0.00052	<0.000		

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location			WSS09 0-0.5 ft	E SSB01 1-2 ft	E SSB02 1-2 ft	E SSB03 1-2 ft	E SSB04 1-2 ft	E SSB05 1-2 ft	E SSB06 1-2 ft	E SSB07 1-2 ft	E SSB08 1-2 ft	E SSB10 1-2 ft	E SSB11 1-2 ft	E SSB12 1-2 ft	E SSB13 1-2 ft	E SSB14 1-2 ft	E SSB15 1-2 ft	E SSS13	SPS01 1-2 ft	SPS02 1-2 ft	SPS03 1-2 ft	SPS04 1-2 ft	SPS05 1-2 ft	SPS06 1-2 ft	SPS07 1-2 ft	
Sample Depth	12/14/2011	11/4/2010	11/5/2010	12/9/2010	12/9/2010	11/5/2010	11/4/2010	11/3/2010	12/8/2010	11/4/2010	1/4/2012	1/4/2012	1/4/2012	3/6/2012	3/6/2012	3/7/2012	12/4/2012	12/2/2010	12/2/2010	12/1/2010	12/2/2010	12/3/2010	12/3/2010	12/1/2010		
Analyte	CAS No.	Units																								
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	---	<0.0028	<0.0029	<0.057	<0.055	<0.0026	<0.014	<0.014	<0.0027	<0.003	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019 JL	---	<0.027	<0.028	<0.0028	<0.15	<0.029	<0.055	<0.0029
Bis(2-chloroethyl)ether	111-44-4	mg/kg	---	<0.0033	<0.0034	<0.066	<0.065	<0.003	<0.016	<0.0032	<0.0035	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019 JL	---	<0.032	<0.032	<0.0033	<0.18	<0.033	<0.064	<0.0034	
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	---	<0.0032	<0.0033	<0.064	<0.062	<0.0029	<0.015	<0.016	<0.0031	<0.0033	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019 JL	---	<0.031	<0.031	<0.0032	<0.17	<0.032	<0.062	<0.0033
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	---	<0.0078	0.024 U	<0.16	<0.15	0.013 U	<0.037	<0.038	<0.0075	0.014 U	0.012	0.0051 U	0.015	<0.0018	0.019 U	0.015 UJL	---	<0.075	<0.076	<0.0078	<0.42	<0.078	<0.15	<0.008
Butyl benzyl phthalate	85-68-7	mg/kg	---	<0.003	<0.003	<0.059	<0.058	<0.0027	<0.014	<0.014	<0.0028	<0.0031	<0.0031	<0.0032	<0.0033	<0.0033 JL	---	<0.029	<0.029	<0.0029	<0.16	<0.03	<0.057	<0.003		
Caprolactam	105-60-2	mg/kg	---	<0.0028	<0.0029	<0.057	<0.055	<0.0026	<0.014	<0.014	<0.0027	<0.003	<0.0023	<0.0022	0.0047 J	<0.0023	<0.0024	0.0067 JL	---	<0.027	<0.028	<0.0028	<0.15	<0.029	<0.055	<0.0029
Carbazole#	86-74-8	mg/kg	---	<0.0026	<0.0026	<0.052 JL	<0.051 JL	0.014	<0.012	0.06	0.003 J	<0.0027	0.0036 J	<0.0018	<0.0019	<0.0018	0.025	<0.0019 JL	---	0.08	<0.025	<0.0026	<0.14	<0.026	0.45	<0.0027
Chrysene	218-01-9	mg/kg	---	<0.0034	<0.0035	0.77	0.39	0.096	0.068	0.4	0.016	<0.0036	0.027	0.0073 J	<0.0027 U	<0.0018	0.19	0.0065 JL	---	0.41	<0.033	<0.0034	1.2	0.12	4.2	0.0083
Dibenz(a,h)anthracene	53-70-3	mg/kg	---	<0.0026	<0.0026	0.45	0.2	0.018	0.047	<0.013	0.0032 J	<0.0027	<0.0023	0.0039 J	<0.0024	<0.0023	0.051	<0.0024 JL	---	<0.025	<0.025	<0.0026	<0.14	0.05 J	1.5	<0.0027
Dibenzofuran#	132-64-9	mg/kg	---	<0.0026	<0.0026	0.19	0.099 J	0.0027 J	0.017 J	<0.013	<0.0025	<0.0027	<0.0018	<0.0019	<0.0018	0.008	<0.0019 JL	---	<0.025	<0.025	<0.0026	<0.14	<0.026	0.11 J	<0.0027	
Diethyl phthalate	84-66-2	mg/kg	---	<0.0039	<0.004	<0.078	<0.076	<0.0036	<0.019	<0.019	<0.0037	<0.0041	<0.0018	<0.0018	<0.0018	<0.0019	0.002 UJL	---	<0.038	<0.038	<0.0039	<0.21	<0.039	<0.075	<0.004	
Dimethyl phthalate	131-11-3	mg/kg	---	<0.0028	<0.0029	<0.057	<0.055	<0.0026	<0.014	<0.014	<0.0027	<0.003	<0.0023	<0.0022	<0.0024	<0.0023	<0.0024 JL	---	<0.027	<0.028	<0.0028	<0.15	<0.029	<0.055	<0.0029	
Di-n-butyl phthalate	84-74-2	mg/kg	---	<0.003	<0.003	<0.059	<0.058	<0.0027	<0.014	<0.014	<0.0028	<0.0031	<0.0047 U	<0.004 U	<0.0043 U	<0.0023	<0.0024	<0.0024 JL	---	<0.029	<0.029	<0.0029	<0.16	<0.03	<0.057	<0.003
Di-n-octyl phthalate	117-84-0	mg/kg	---	<0.0034	<0.0035	<0.068	<0.067	0.0093	<0.016	<0.017	<0.0033	<0.0036	<0.0023 U	<0.0022	<0.0024	<0.0023	<0.0024 JL	---	<0.033	<0.033	<0.0034	<0.18	<0.034	<0.066	<0.0035	
Fluoranthene	206-44-0	mg/kg	---	<0.0026	0.0034 J	0.38	0.23	0.2	0.018 J	0.56	0.028	<0.0027	0.036	0.0079	0.0048 J	<0.0018	0.22	0.013 JL	---	0.59	0.11	<0.0026	<0.14	0.28	8.3	0.014
Fluorene	86-73-7	mg/kg	---	<0.0026	<0.0026	0.096 J	0.053 J	0.0047 J	0.012 J	<0.013	<0.0025	<0.0027	0.0024 J	<0.0018	<0.0019	<0.0018	0.011	<0.0019 JL	---	0.033 J	<0.025	<0.0026	0.71	<0.026	0.47	<0.0027
Hexachlorobenzene	118-74-1	mg/kg	---	<0.0031	<0.0031	<0.061	<0.06	<0.0028	<0.015	<0.015	<0.0029	<0.0032	<0.0018	<0.0019	<0.0019	<0.0019	<0.0019 JL	---	<0.03	<0.03	<0.0031	<0.17	<0.031	<0.059	<0.0031	
Hexachlorobutadiene	87-68-3	mg/kg	---	<0.0052	<0.0053	<0.1	<0.1	<0.0048	<0.025	<0.025	<0.005	<0.0054	<0.0018	<0.0018	<0.0018	<0.0019	<0.0019 JL	---	<0.05	<0.05	<0.0052	<0.28	<0.052	<0.1	<0.0053	
Hexachlorocyclopentadiene	77-47-4	mg/kg	---	<0.0043	<0.0043	<0.085	<0.083	<0.0039	<0.02	<0.021	<0.0041	<0.0044 JL														

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			SPSB08 1-2 ft 12/1/2010	SPSB09 1-2 ft 11/30/2010	SPSB09 1-2 ft 11/30/2010	SPSB10 1-2 ft 11/30/2010	SPSB11 1-2 ft 11/30/2010	WSB01 1-2 ft 11/1/2010	WSB02 0-1 ft 11/3/2010	WSB02 1-2 ft 11/3/2010	WSB03 1-2 ft 11/3/2010	WSB04 1-2 ft 12/6/2010	WSB09 1-2 ft 11/2/2010	WSB09 1-2 ft 12/7/2010
Analyte	CAS No.	Units												
METALS														
Aluminum#	7429-90-5	mg/kg	10400	8000 J	4740 J	5540	10200	7210	9030	9130	14100	17800	5930	
Antimony	7440-36-0	mg/kg	0.61	<0.25	0.39 J	<0.25	<0.27	<0.26	<0.31	<0.26	<0.27	<0.31	<0.26	
Arsenic	7440-38-2	mg/kg	11.5	3.24	2.3	2.2	2.81	2.39	3.38	3.03	2.67	4.56	2.7	
Barium#	7440-39-3	mg/kg	2160	241	177	670	175	141	442	1010	220	396	90.9	
Beryllium	7440-41-7	mg/kg	0.583	0.441 J	0.285 J	0.33 J	0.53 J	0.48 J	0.672	0.517 J	0.684	0.992	0.382 J	
Cadmium#	7440-43-9	mg/kg	19.6	0.208 J	0.223 J	0.208 J	0.19 J	0.551	0.362 J	0.215 J	0.267 J	0.218 J	0.135 J	
Chromium#	7440-47-3	mg/kg	80.6	10.7	15.3	9.98	8.65	4.78	7.91	6.95	8.14	10.2	4.36	
Cobalt	7440-48-4	mg/kg	8.57	3.49	2.02	2.19	3.75	3.19	3.88	3.4	3.62	6.03	2.34	
Copper#	7440-50-8	mg/kg	179	13.2	9.16	5.86	5.62	7.62	8.08	6	7.44	8.78	11.6 JL	
Lead#	7439-92-1	mg/kg	359	24.2 J	68.8 J	27.3	16.8	34.1	31.2	25.7	21.7	12	7.95	
Manganese#	7439-96-5	mg/kg	483	176 J	99.1 J	156	192	173	233	171	183	375	109	
Nickel#	7440-02-0	mg/kg	60.1	5.93	4.01	4.86	7.23	4.65	6.43	5.92	6.48	9.93	3.85	
Selenium#	7782-49-2	mg/kg	2.5	0.5 J	0.317 J	0.403 J	0.43 J	0.578	0.798	0.806	0.538	0.966	0.427 J	
Silver#	7440-22-4	mg/kg	1.6	0.0704 J	0.0475 J	0.0451 J	<0.044	0.0495 J	0.0539 J	<0.21	0.0777 J	<0.05	<0.042	
Thallium	7440-28-0	mg/kg	0.196 J	0.138 J	0.072 J	0.072 J	0.117 J	0.176 J	0.146 J	0.123 J	0.16 J	0.37 J	0.168 U	
Vanadium#	7440-62-2	mg/kg	16.4	14.8 J	8.76 J	13	17.7	10.8	13.5	12.3	19.2	25.4	8.88	
Zinc#	7440-66-6	mg/kg	1540	30	32.4	36.5	64	114	76.5	101	93.3	33	20.8 JH	
Mercury#	7439-97-6	mg/kg	0.428	0.0393 J	0.0821 J	0.0195	0.00528	0.00917	0.0233	0.0123	0.103	0.00905	0.00619	
Cyanide#	57-12-5	mg/kg	<0.69	<0.66	<0.62	<0.67	<0.67	<0.68	<0.81	<0.71	<0.67	<0.76	<0.62	
PESTICIDES and PCBs														
4,4'-DDD#	72-54-8	mg/kg	0.04	0.027 J	0.029 J	0.086	<0.0058	<0.0029	<0.0034	<0.003	<0.0028	<0.0065	0.0052	
4,4'-DDE#	72-55-9	mg/kg	<0.0059	<0.0058	<0.0056	<0.0057	<0.0058	<0.0029	<0.0034	<0.003	<0.0028	<0.0065	<0.00055	
4,4'-DDT#	50-29-3	mg/kg	0.058	<0.0058	0.088	<0.0057	<0.0058	<0.0029	<0.0034	<0.003	<0.0028	<0.0065	0.011	
Aldrin	309-00-2	mg/kg	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0018	<0.002	<0.0018	<0.0017	<0.0039	<0.00033	
alpha-BHC	319-84-6	mg/kg	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0018	<0.002	<0.0018	<0.0017	<0.0039	<0.00033	
alpha-Chlordane#	5103-71-9	mg/kg	<0.0023	0.011 J	0.011 J	0.25 J	<0.0023	<0.0012	<0.0014	<0.0012	0.011 J	<0.0026	<0.00022	
beta-BHC#	319-85-7	mg/kg	0.021	0.018 U	<0.0034	<0.0034	<0.0035	<0.0018	<0.002	<0.0018	<0.0017	<0.0039	<0.00033	
delta-BHC	319-86-8	mg/kg	<0.0023	<0.0023	<0.0023	<0.0023	<0.0023	<0.0012	<0.0014	<0.0012	<0.0011	<0.0026	<0.00022	
Dieldrin#	60-57-1	mg/kg	<0.0059	<0.0058	0.025 J	<0.0057	<0.0058	<0.0029	<0.0034	<0.003	<0.0028	<0.0065	0.0026 J	
Endosulfan I	959-98-8	mg/kg	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0018	<0.002	<0.0018	<0.0017	<0.0039	<0.00033	
Endosulfan II	33213-65-9	mg/kg	<0.007	<0.0069	<0.0068	<0.0068	<0.0069	<0.0035	<0.0041	<0.0036	<0.0034	<0.0078	<0.00066	
Endosulfan sulfate	1031-07-8	mg/kg	<0.007	<0.0069	<0.0068	<0.0068	<0.0069	<0.0035	<0.0041	<0.0036	<0.0034	<0.0078	<0.00066	
Endrin#	72-20-8	mg/kg	<0.007	<0.0069	<0.0068	<0.0068	<0.0069	<0.0035	<0.0041	<0.0036	<0.0034	<0.0078	<0.00066	
Endrin aldehyde#	7421-93-4	mg/kg	<0.007	<0.0069	0.025 J	<0.0068	<0.0069	<0.0035	<0.0041	<0.0036	<0.0034	<0.0078	<0.00066	
gamma-BHC#	58-89-9	mg/kg	<0.0023	<0.0023	<0.0023	<0.0023	<0.0023	<0.0012	<0.0014	<0.0012	<0.0011	<0.0026	<0.00022	
gamma-Chlordane#	5103-74-2	mg/kg	<0.0023	0.018 J	0.011 J	0.31	<0.0023	<0.0012	<0.0014	<0.001				

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			SPSB08 1-2 ft 12/1/2010	SPSB09 1-2 ft 11/30/2010	SPSB09 1-2 ft 11/30/2010	SPSB10 1-2 ft 11/30/2010	SPSB11 1-2 ft 11/30/2010	WSB01 1-2 ft 11/1/2010	WSB02 0-1 ft 11/3/2010	WSB02 1-2 ft 11/3/2010	WSB03 1-2 ft 11/3/2010	WSB04 1-2 ft 12/6/2010	WSB09 1-2 ft 11/2/2010	WSB09 1-2 ft 12/7/2010
Analyte	CAS No.	Units												
Bromodichloromethane	75-27-4	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Bromoform	75-25-2	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Bromomethane	74-83-9	mg/kg	<0.0009	<0.0011	<0.00086	<0.00087	<0.00093	<0.00093	<0.001	<0.0009	<0.00092	<0.001	<0.001	
Carbon disulfide	75-15-0	mg/kg	<0.0009	<0.0011	<0.00086	<0.00087	<0.00093	<0.00093	<0.001	<0.0009	<0.00092	<0.001	<0.001	
Carbon tetrachloride	56-23-5	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Chlorobenzene	108-90-7	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Chloroethane	75-00-3	mg/kg	<0.0009	<0.0011	<0.00086	<0.00087	<0.00093	<0.00093	<0.001	<0.0009	<0.00092	<0.001	<0.001	
Chloroform	67-66-3	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Chloromethane	74-87-3	mg/kg	<0.0009	<0.0011	<0.00086	<0.00087	<0.00093	<0.00093	<0.001	<0.0009	<0.00092	<0.001	<0.001	
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Cyclohexane	110-82-7	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Dibromochloromethane	124-48-1	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Ethylbenzene	100-41-4	mg/kg	0.013 J	0.017 J	0.006	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Isopropylbenzene	98-82-8	mg/kg	<0.00045	<0.00054	0.032 J	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Methyl acetate	79-20-9	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Methylcyclohexane	108-87-2	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Methylene chloride	75-09-2	mg/kg	<0.0009	<0.0011	<0.00086	<0.00087	<0.00093	<0.00093	0.032 J	0.0098 J	<0.00092	<0.001	<0.001	
Naphthalene	91-20-3	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	0.012	<0.00052	<0.00051	
n-Butylbenzene	104-51-8	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
n-Propylbenzene	103-65-1	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	0.00063 J	<0.00046	<0.00052	<0.00051	
sec-Butylbenzene	135-98-8	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Styrene	100-42-5	mg/kg	<0.00045	0.024 J	0.019 J	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
tert-Butylbenzene	98-06-6	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Tetrachloroethene	127-18-4	mg/kg	<0.00054	<0.00065	<0.00052	<0.00052	<0.00056	<0.00056	<0.00062	<0.00054	<0.00055	<0.00063	<0.00061	
Toluene	108-88-3	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
trans-1,2-Dichloroethene	156-60-5	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
trans-1,3-Dichloropropene	10061-02-6	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Trichloroethene	79-01-6	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Trichlorofluoromethane	75-69-4	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Vinyl chloride	75-01-4	mg/kg	<0.00045	<0.00054	<0.00043	<0.00044	<0.00046	<0.00046	<0.00052	<0.00045	<0.00046	<0.00052	<0.00051	
Xylenes, Total	1330-20-7	mg/kg	<0.0013	<0.0016	<0.0013	<0.0013	<0.0014	<0.0014	<0.0016	<0.0013	<0.0014	<0.0016	<0.0015	
SEMIVOLATILE ORGANIC COMPOUNDS														
1,1'-Biphenyl	92-52-4	mg/kg	0.077 J	<0.033	<0.033	<0.033	<0.033	<0.039						

Soil Analytical Data Summary - South Area
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			SPSB08 1-2 ft 12/1/2010	SPSB09 1-2 ft 11/30/2010	SPSB09 1-2 ft 11/30/2010	SPSB10 1-2 ft 11/30/2010	SPSB11 1-2 ft 11/30/2010	WSB01 1-2 ft 11/1/2010	WSB02 0-1 ft 11/3/2010	WSB02 1-2 ft 11/3/2010	WSB03 1-2 ft 12/6/2010	WSB04 1-2 ft 11/2/2010	WSB09 1-2 ft 12/7/2010	
Analyte	CAS No.	Units												
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.028	<0.028	<0.027	<0.027	<0.028	<0.0028	<0.0033	<0.0029	<0.014	<0.0031	<0.0026	
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.033	<0.032	<0.032	<0.032	<0.032	<0.0033	<0.0038	<0.0033	<0.016	<0.0036	<0.0031	
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.032	<0.031	<0.03	<0.031	<0.031	<0.0032	<0.0037	<0.0032	<0.015	<0.0035	<0.003	
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	<0.077	<0.076	<0.074	0.29	<0.076	0.0091	0.012 U	<0.0079	<0.037	0.011	<0.0072	
Butyl benzyl phthalate	85-68-7	mg/kg	<0.029	<0.029	<0.028	<0.028	<0.029	<0.0029	<0.0034	<0.003	<0.014	<0.0033	<0.0027	
Caprolactam	105-60-2	mg/kg	<0.028	<0.028	<0.027	<0.027	<0.028	<0.0028	<0.0033	<0.0029	<0.014	<0.0031	<0.0026	
Carbazole#	86-74-8	mg/kg	<0.026	<0.025	<0.025	0.029 J	<0.025	<0.0026	0.0057 U	<0.0026	0.024 J	<0.0029	<0.0024	
Chrysene	218-01-9	mg/kg	0.14	0.31	0.1	0.25	<0.033	0.029	0.054	0.12	0.39	0.0097	<0.0032	
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.11	<0.025	<0.025	<0.025	<0.025	<0.0026	<0.003	<0.0026	0.07	0.0044 J	<0.0024	
Dibenzofuran#	132-64-9	mg/kg	0.038 J	<0.025	<0.025	<0.025	<0.025	<0.0026	<0.003	<0.0026	<0.012	<0.0029	<0.0024	
Diethyl phthalate	84-66-2	mg/kg	<0.039	<0.038	<0.037	<0.037	<0.038	<0.0039	<0.0045	<0.0039	<0.019	<0.0043	<0.0036	
Dimethyl phthalate	131-11-3	mg/kg	<0.028	<0.028	<0.027	<0.027	<0.028	<0.0028	<0.0033	<0.0029	<0.014	<0.0031	<0.0026	
Di-n-butyl phthalate	84-74-2	mg/kg	<0.029	<0.029	<0.028	<0.028	<0.029	<0.0029	<0.0034	<0.003	<0.014	<0.0033	<0.0027	
Di-n-octyl phthalate	117-84-0	mg/kg	0.081	<0.033	<0.033	<0.033	<0.033	<0.0034	<0.0039	<0.0035	<0.016	<0.0038	<0.0032	
Fluoranthene	206-44-0	mg/kg	0.074 J	0.59 J	0.22 J	0.36	0.036 J	0.0051 J	0.053	0.03	0.62	0.014	<0.0024	
Fluorene	86-73-7	mg/kg	0.033 J	0.033 J	<0.025	<0.025	<0.025	<0.0026	<0.003	<0.0026	<0.012	<0.0029	<0.0024	
Hexachlorobenzene	118-74-1	mg/kg	<0.03	<0.03	<0.029	<0.03	<0.03	<0.0031	<0.0035	<0.0031	<0.015	<0.0034	<0.0028	
Hexachlorobutadiene	87-68-3	mg/kg	<0.052	<0.051	<0.05	<0.05	<0.051	<0.0052	<0.006	<0.0052	<0.025	<0.0057	<0.0048	
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.042	<0.042	<0.041	<0.041	<0.042	<0.0042	<0.0049	<0.0043	<0.02	<0.0047	<0.0039	
Hexachloroethane	67-72-1	mg/kg	<0.046	<0.045	<0.044	<0.044	<0.045	<0.0046	<0.0053	<0.0047	<0.022	<0.0051	<0.0043	
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.11	<0.04	<0.039	<0.04	<0.04	<0.023	0.074	<0.0042	0.19	0.0097	<0.0038	
Isophorone	78-59-1	mg/kg	<0.035	<0.035	<0.034	<0.034	<0.035	<0.0035	<0.0041	<0.0036	<0.017	<0.0039	<0.0033	
Naphthalene#	91-20-3	mg/kg	0.33	<0.038	<0.037	<0.037	<0.038	<0.0039	<0.0045	<0.0039	<0.019	<0.0043	<0.0036	
Nitrobenzene	98-95-3	mg/kg	<0.039	<0.038	<0.038	<0.037	<0.037	<0.038	<0.0039	<0.0045	<0.0039	<0.019	<0.0043	<0.0036
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.047	<0.046	<0.045	<0.045	<0.046	<0.0047	<0.0054	<0.0048	<0.023	<0.0052	<0.0044	
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.026	<0.025	<0.025	<0.025	<0.025	<0.0026	<0.003	<0.0026	<0.012	<0.0029	<0.0024	
Pentachlorophenol	87-86-5	mg/kg	<0.033	<0.032	<0.032	<0.032	<0.032	<0.032	<0.0033	<0.0038	<0.0033	<0.016	<0.0036	<0.0031 JL
Phenanthrene	85-01-8	mg/kg	0.17	0.26	0.071 J	0.17	<0.035	<0.0035	0.019	0.011	0.19	0.0091	<0.0033	
Phenol	108-95-2	mg/kg	<0.039	<0.038	<0.038	<0.037	<0.037	<0.038	<0.0039	<0.0045	<0.0039	<0.019	<0.0043	<0.0036 JL
Pyrene	129-00-0	mg/kg	0.15	0.52 J	0.14 J	0.29	<0.025	0.13	0.042	0.35	0.51	0.011	<0.0024	
Low Molecular Weight PAHs	LPAH	mg/kg	1.415	0.539	0.248	0.368	0.204	0.021	0.0472	0.0316	0.309	0.0285	<0.0195	
High Molecular Weight PAHs#	HPAH	mg/kg	0.748	2.045	0.611	1.028	0.178	0.4057	0.279	0.9456	2.21	0.0575	<0.016	
Total PAHs	TPAH	mg/kg	3.277	3.501	1.169	1.745	0.558	0.5614	0.5352	1.2401	3.452	0.131	<0.0522	

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENSS01 0-0.5 ft	ENSS02 0-0.5 ft	ENSS03 0-0.5 ft	ENSS03 0-0.5 ft	ENSS04 0-0.5 ft	ENSS05 0-0.5 ft	ENSS06 0-0.5 ft	ENSS07 0-0.5 ft	ENSS08 0-0.5 ft	ENSS09 0-0.5 ft	ENSS10 0-0.5 ft	ENSS11 0-0.5 ft	ENSS11 0-0.5 ft	ESSS06 0-0.5 ft	ESSS07 0-0.5 ft	ESSS08 0-0.5 ft	NPSS01 0-0.5 ft	NPSS02 0-0.5 ft	NPSS03 0-0.5 ft	NPSS04 0-0.5 ft	NPSS05 0-0.5 ft	NPSS06 0-0.5 ft	NPSS07 0-0.5 ft	NPSS08 0-0.5 ft
Sample Depth	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	12/14/2011	1/4/2012	1/4/2012	1/4/2012	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	
Analyte	CAS No.	Units																								
METALS																										
Aluminum#	7429-90-5	mg/kg	5420	1830	4060	3790	8210	8480	7220	3110	9220	---	---	---	---	8350	635	6280	11700	7920	6050	1600	7200	7480	6280	6610
Antimony	7440-36-0	mg/kg	0.671	0.292 J	<0.24	0.257 J	<0.24	<0.24	1	<0.25	<0.26	---	---	---	---	0.262 J	0.283 J	<0.24	<0.25	<2.8	0.53 J	<2.4	<2.7	<2.6	<2.8	<2.6
Arsenic#	7440-38-2	mg/kg	6.42	2.51	2.44	2.41	2.35	3.44	8.7	6.11	4.31	---	---	---	---	4.31	1.33	2.02	1.65	3.23 J	6.56	6.63	4.59 J	5.04 J	4.77 J	2.96 J
Barium#	7440-39-3	mg/kg	668	1080	1160	493	1610	11800	979	1380	---	---	---	---	636	178	332	293	370	468	3590	522	1420	1010	327	
Beryllium	7440-41-7	mg/kg	0.283 J	0.122 J	0.192 J	0.184 J	0.362 J	0.37 J	0.335 J	0.185 J	0.392 J	---	---	---	---	0.448 J	0.0705 J	0.318 J	0.585	0.829 J	0.305 J	<0.49	0.786 J	0.669 J	0.677 J	0.715 J
Cadmium#	7440-43-9	mg/kg	15.1	1.76	0.745	1.06	0.235 J	1.16	0.702	1.08	15.6	---	---	---	---	5.74	0.923	0.351 J	1.27	1.38 J	7.38	2.08 J	9.47	2.06 J	5.6	0.907 J
Chromium#	7440-47-3	mg/kg	25.6	8.69	8.26	8	5.34	8.64	15.3	5.71	9.85	---	---	---	---	37.1	7.98	4.01	61.8	19	30.5 JL	13	35.3	19.2	61.5	
Cobalt	7440-48-4	mg/kg	2.59	1.22	1.46	1.46	2.46	2.69	1.36	4.9	---	---	---	---	3.39	1.2	2.25	2.27	3.29 J	2.74	0.518 J	3.24 J	4.38 J	5.11 J	3.28 J	
Copper#	7440-50-8	mg/kg	26.9	13.8	7.4	7.26	5.82	9.49	13	7.2	9.08	---	---	---	---	22.6	5.69	5.48	14.3	15.6	27.2	8.26	34.5	18.1	25.9	
Lead#	7439-92-1	mg/kg	59.2	48.8	37.7	39.8	17.7	45	57.1	12.4	38	---	---	---	---	138	35.9	12.9	136	63.6	173	53.5	158	37	1800	10.1
Manganese#	7439-96-5	mg/kg	154	81.9	101	102	146	165	170	112	264	---	---	---	---	257	45.8	144	126	205	262	93.4	205	254	379	162
Nickel#	7440-02-0	mg/kg	6.74	2.97	3.49	3.6	4.44	5.39	6.2	5.34	5.7	---	---	---	---	7.68	2.38	3.61	12.3	7.73	6.1	4.1 J	6.48	15.1	12	10.3
Selenium#	7782-49-2	mg/kg	0.461 J	0.309 J	0.421 J	0.395 J	0.351 J	0.484 J	0.353 J	7.52	6.51	---	---	---	---	4.96	<0.24	0.393 J	0.584	<2.8	2.5	<2.4	12	2.7 J	5.41 J	<2.6
Silver#	7440-22-4	mg/kg	0.0468 J	<0.037	<0.038	<0.036	<0.038	0.0512 J	0.0639 J	0.0963 J	<0.042	---	---	---	0.424 J	<0.038	<0.038	0.0937 J	<0.45	0.641	<0.39	0.585 J	<0.41	<0.44	<0.41	
Thallium	7440-28-0	mg/kg	0.147 U	<0.064	<0.066	<0.064	0.112 U	0.121 U	0.101 U	0.082 U	0.13 U	---	---	---	0.144 J	0.0765 J	0.203 J	0.11 J	<0.79	0.254 J	<0.69	<0.76	<0.72	<0.78	<0.72	
Vanadium#	7440-62-2	mg/kg	7.98	6.13	7.64	7.27	9.41	9.82	16	9.69	15.6	---	---	---	13.3	4.17	7.91	21.8	14.9	10.4	5.22	13.8	23.8	14.1	22	
Zinc#	7440-66-6	mg/kg	756	890	960	658	96.8	362	396	196	356	---	---	---	715	2430	45.1	1030	361	962	1130	888	496	1130	116	
Mercury#	7439-97-6	mg/kg	0.897	0.0723	0.253	0.273	0.0446	0.449	0.248	0.0973	0.19	0.0404	0.526	0.58	0.451	8.97	0.0342	0.24	0							

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENSS01 0-0.5 ft	ENSS02 0-0.5 ft	ENSS03 0-0.5 ft	ENSS03 0-0.5 ft	ENSS04 0-0.5 ft	ENSS05 0-0.5 ft	ENSS06 0-0.5 ft	ENSS07 0-0.5 ft	ENSS08 0-0.5 ft	ENSS09 0-0.5 ft	ENSS10 0-0.5 ft	ENSS11 0-0.5 ft	ENSS11 0-0.5 ft	ESSS06 0-0.5 ft	ESSS07 0-0.5 ft	ESSS08 0-0.5 ft	NPSS01 0-0.5 ft	NPSS02 0-0.5 ft	NPSS03 0-0.5 ft	NPSS04 0-0.5 ft	NPSS05 0-0.5 ft	NPSS06 0-0.5 ft	NPSS07 0-0.5 ft	NPSS08 0-0.5 ft	
Sample Depth	CAS No.	Units	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	12/14/2011	1/4/2012	1/4/2012	1/4/2012	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010		
Analyte																											
Chloroethane	75-00-3	mg/kg	<0.0012	<0.00087	<0.0012	<0.0011	<0.0015	<0.0012	<0.00095	<0.0013	<0.0014	---	---	---	---	<0.0012	<0.0012	<0.0012	<0.001	<0.0015	<0.001	<0.0011	<0.0013	<0.0018	<0.0011		
Chloroform	67-66-3	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Chloromethane	74-87-3	mg/kg	<0.0012	<0.00087	<0.0012	<0.0011	<0.0015	<0.0012	<0.00095	<0.0013	<0.0014	---	---	---	---	<0.0012	<0.0012	<0.0012	<0.001	<0.0015	<0.001	<0.0011	<0.0013	<0.0018	<0.0011		
cis	1,2-Dichloroethene	156-59-2	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053
cis	-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053
Cyclohexane	110-82-7	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Dibromochloromethane	124-48-1	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Ethylbenzene	100-41-4	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Isopropylbenzene	98-82-8	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Methyl acetate	79-20-9	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Methylcyclohexane	108-87-2	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
Methylene chloride	75-09-2	mg/kg	<0.0012	0.001 U	0.0037 U	0.0012 U	0.0016 U	0.0019 U	0.0015 U	---	---	---	---	---	---	<0.0012	0.0021 U	0.003 U	<0.001	<0.001	0.0031 U	<0.001	<0.0011	0.0013	<0.0018	0.0017 J	
Naphthalene	91-20-3	mg/kg	0.0026 U	0.0018 U	0.0025 U	0.0022 U	0.00076	0.0025 U	<0.00048	<0.00067	0.0029 U	---	---	---	---	<0.00058	0.00062 U	<0.00058	0.00064 U	<0.00051	0.001 U	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
n-Butylbenzene	104-51-8	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
n-Propylbenzene	103-65-1	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061	<0.00048	<0.00067	<0.0007	---	---	---	---	<0.00058	<0.00062	<0.00058	<0.0005	<0.00051	<0.00077	<0.0005	<0.00053	<0.00067	<0.00089	<0.00053	
sec-Butylbenzene	135-98-8	mg/kg	<0.00062	<0.00043	<0.00061	<0.00055	<0.00076	<0.00061</td																			

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENSS01 0-0.5 ft	ENSS02 0-0.5 ft	ENSS03 0-0.5 ft	ENSS03 0-0.5 ft	ENSS04 0-0.5 ft	ENSS05 0-0.5 ft	ENSS06 0-0.5 ft	ENSS07 0-0.5 ft	ENSS08 0-0.5 ft	ENSS09 0-0.5 ft	ENSS10 0-0.5 ft	ENSS11 0-0.5 ft	ESSS06 0-0.5 ft	ESSS07 0-0.5 ft	ESSS08 0-0.5 ft	NPSS01 0-0.5 ft	NPSS02 0-0.5 ft	NPSS03 0-0.5 ft	NPSS04 0-0.5 ft	NPSS05 0-0.5 ft	NPSS06 0-0.5 ft	NPSS07 0-0.5 ft	NPSS08 0-0.5 ft	
Sample Depth	CAS No.	Units	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	10/11/2010	12/14/2011	1/4/2012	1/4/2012	10/12/2010	10/12/2010	10/12/2010	10/12/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	10/13/2010	
Analyte																										
Dimethyl phthalate	131-11-3	mg/kg	<0.0027	<0.0024	0.0057 J	0.0085	<0.0026	<0.0026	<0.025	<0.0026	<0.0028	---	---	---	---	<0.027	<0.0024	<0.0025	<0.025	<0.0028 JL	<0.0027	<0.0024 JL	<0.0027 JL	<0.042	<0.13	
Di-n-butyl phthalate	84-74-2	mg/kg	0.011	0.0046 J	0.0077	0.0083	0.0035 J	0.011	0.041 J	<0.0027	0.0064 J	---	---	---	---	<0.028	0.025 U	<0.0026	<0.026	0.0036 UJL	0.0096	0.0072 UJL	0.0046 UJL	<0.028 JL	<0.043	<0.14
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0033	0.044	<0.003 J	0.062 J	<0.0032	<0.0032	<0.03	<0.0031	0.0073 J	---	---	---	---	<0.033	<0.0029	<0.0031	<0.031	<0.0034 JL	<0.0033	0.042 JL	<0.0033 JL	<0.032 JL	<0.05	<0.16
Fluoranthene	206-44-0	mg/kg	0.053	0.055	0.09	0.11	0.049	0.09	0.052 J	<0.0024	0.05	---	---	---	---	0.3	0.075	0.086	0.33	0.74	0.56	0.035 JL	0.74	0.061 JL	0.31	<0.12
Fluorene	86-73-7	mg/kg	<0.0025	<0.0022	<0.0023	0.0038 J	<0.0024	<0.0024	<0.023	<0.0024	<0.0025	---	---	---	---	<0.025	<0.0022	0.0032 J	<0.0023	0.012 JL	0.011	<0.0022 JL	0.012 JL	<0.0025 JL	<0.038	<0.12
Hexachlorobenzene	118-74-1	mg/kg	<0.003	<0.0026	<0.0027	<0.0029	<0.0029	<0.0027	<0.0028	<0.003	---	---	---	---	<0.03	<0.0026	<0.0027	<0.027	<0.0031 JL	<0.003	<0.0026 JL	<0.003 JL	<0.0029 JL	<0.045	<0.14	
Hexachlorobutadiene	87-68-3	mg/kg	<0.005	<0.0044	<0.0046	<0.0049	<0.0048	<0.0046	<0.0047	<0.0051	---	---	---	---	<0.05	<0.0044	<0.0046	<0.046	<0.0052 JL	<0.005	<0.0044 JL	<0.005 JL	<0.0049 JL	<0.076	<0.24	
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0041	<0.0036	<0.0038	<0.004	<0.004	<0.037	<0.0039	<0.0042	---	---	---	---	<0.041	<0.0036	<0.0038	<0.038	<0.0042 JL	<0.0041 JL	<0.0036 JL	<0.0041 JL	<0.004 JL	<0.062	<0.2	
Hexachloroethane	67-72-1	mg/kg	<0.0045	<0.0039	<0.0041	<0.0043	<0.0043	<0.004	<0.0042	<0.0045	---	---	---	---	<0.044	<0.0039	<0.0041	<0.041	<0.0046 JL	<0.0045	<0.0039 JL	<0.0044 JL	<0.068	<0.22		
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.036	0.027	0.048	0.055	0.025	0.052	0.043 J	<0.0038	0.019	---	---	---	---	<0.04	0.02	0.027	0.15	<0.0041 JL	0.17	<0.0035 JL	<0.004 JL	<0.039 JL	<0.061	<0.19
Isophorone	78-59-1	mg/kg	<0.0034	<0.003	<0.0031	<0.0033	<0.0033	<0.031	<0.0032	<0.0035	---	---	---	---	<0.034	<0.003	<0.0032	<0.032	<0.0035 JL	<0.0034	<0.003 JL	<0.034 JL	<0.052	<0.17		
Naphthalene	91-20-3	mg/kg	<0.0038	<0.0033	<0.0035	<0.0036	<0.0036	<0.034	<0.0035	<0.0038	---	---	---	---	<0.038	<0.0033	0.0048 J	<0.035	0.019 JL	0.0043 J	<0.0033 JL	0.0044 JL	<0.0037 JL	<0.057	<0.18	
Nitrobenzene	98-95-3	mg/kg	<0.0038	<0.0033	<0.0035	<0.0036	<0.0036	<0.034	<0.0035	<0.0038	---	---	---	---	<0.038	<0.0033	<0.0035	<0.035	<0.0039 JL	<0.0038	<0.0033 JL	<0.0038 JL	<0.057	<0.18		
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0046	<0.004	<0.0042	<0.0042	<0.0044	<0.0044	<0.041	<0.0043	<0.0046	---	---	---	---	<0.046	<0.004	<0.0042	<0.042	<0.0047 JL	<0.0046	<0.004 JL	<0.045 JL	<0.069	<0.22	
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0025	<0.0022	<0.0023	<0.0024	<0.0024	<0.023	<0.0024	<0.0025	---	---	---	---	<0.025	<0.0022	<0.0023	<0.023	<0.0026 JL	<0.0025	<0.0022 JL	<0.0025 JL	<0.038	<0.12		
Pentachlorophenol#	87-86-5	mg/kg	<0.0032	<0.0028 JL	<0.0029	<0.0031	<0.0031	<0.029	<0.003	<0.0032	---	---	---	---	<0.032 JL	<0.0028 JL	<0.0029	<0.03	<0.0033 JL	<0.0032 JL	<0.0031 JL	<0.049 JL	<0.16			
Phenanthrene	85-01-8	mg/kg	0.014	0.021	0.03	0.042	0.02	0.029	<0.031	<0.0032	0.015	---	---	---	---	0.094	0.029	0.042	0.12	0.19 JL	0.18	0.011 JL	0.31 JL	0.016 JL	0.093 J	<0.17
Phenol	108-95-2	mg/kg	<0.0038	<0.0033 JL	<0.0035	<0.0036	<0.0036	<0.034	<0.0035	<0.0038	---	---	---	---	<0.038 JL	<0.0033 JL	<0.0035	<0.035	<0.0039 JL	<0.0038 JL	<0.0033 JL	<0.0038 JL	<0.057 JL	<0.18		
Pyrene	129-00-0	mg/kg	0.05	0.05	0.071	0.079	0.04	0.076	0.046 J	<0.0024	0.04	---	---	---	---	0.24	0.054	0.063	0.3	0.55	0.36</					

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location	NPSS08	WSS05	WSS06	WSS07	WSS08	WSS10	WSS11	WSS11	ENSB01	ENSB02	ENSB03	ENSB04	ENSB05	ENSB06	ENSB07	ENSB08	ENSB09	ENSB10	ENSB11	ENSB12	ENSB13	ENSB14	ENSB15	ENSB16				
Sample Depth	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft				
Sample Date	10/13/2010	10/7/2010	10/8/2010	10/7/2010	10/8/2010	12/14/2011	12/14/2011	12/14/2011	11/8/2010	11/8/2010	11/8/2010	12/9/2010	11/8/2010	11/9/2010	12/8/2010	11/9/2010	11/9/2010	1/4/2012	1/4/2012	12/3/2012	12/3/2012	12/3/2012	12/3/2012					
Analyte																												
METALS																												
Aluminum#	7429-90-5	mg/kg	6300	17800	16900	7250	7840	---	---	---	9700	10000	9150	11400	6750	5290	8700	3720	4690	4550	---	---	---	---	---	---		
Antimony	7440-36-0	mg/kg	<2.6	0.506 U	<0.27	0.428 U	<0.27	---	---	---	<0.27	<0.29	<0.26	<1.3	<0.26	<0.26	0.301 J	<0.26	<0.26	<0.25	---	---	---	---	---	---		
Arsenic#	7440-38-2	mg/kg	8.36	3.77	4.67	3.65	4.12	4.96	3.06	4.47	7.67	3.36	3.39	5.95	9.85	4.01	8.09	2.41	2.83	3.22	4.25	4.98	5.22	6.79	4.98	2.65	5.23	6.55
Barium#	7440-39-3	mg/kg	314	332	1110	490	689	---	---	---	188	289	100	941	619	2920	289	107	158 J	283 J	---	---	---	---	---	---	---	
Beryllium	7440-41-7	mg/kg	0.678 J	0.797	0.76	0.429 J	0.399 J	---	---	---	0.742	0.705	0.625	0.466 J	0.506 J	0.421 J	0.494 J	0.321 J	0.364 J	0.386 J	---	---	---	---	---	---	---	
Cadmium#	7440-43-9	mg/kg	0.743 J	2.33	0.356 J	3.57	1.29	---	---	---	0.296 J	0.159 J	0.147 J	1.13 J	1.5	5.44	12	0.126 J	3.72	2.74	---	---	---	---	---	---	---	
Chromium#	7440-47-3	mg/kg	8.28	51	14.8	36	12.6	---	---	---	5.4	5.6	5.08	14.5	6.69	5.13	8.44	2.67	3.67	4.47	---	---	---	---	---	---	---	
Cobalt	7440-48-4	mg/kg	3.21 J	4.05	4.66	2.51	2.93	---	---	---	5.04	3.84	3.92	3.33	3.85	3.37	4.28	2.76	2.47	2.85	---	---	---	---	---	---	---	
Copper#	7440-50-8	mg/kg	5.84	21.8 JH	6.73	18.7	10.8	---	---	---	5.11	5.05	4.32	11.4	10.4	17.4	57.7	3.13	29.9 J	13.4 J	---	---	---	---	---	---	---	
Lead#	7439-92-1	mg/kg	9.25	115	14	113	20.6	---	---	---	10.9	8.46	7.02	55	22.1	71.6	155	11.5	141 J	49.3 J	---	---	---	---	---	---	---	
Manganese#	7439-96-5	mg/kg	189	221	245	178	209	---	---	---	424	208	218	207	271	328	138	152	167	---	---	---	---	---	---	---		
Nickel#	7440-02-0	mg/kg	8.35	11.6	8.29	15.4	7.72	---	---	---	6.65	5.74	5.57	6.52	5.8	5.57	7.04	3.25	3.59	4.46	---	---	---	---	---	---	---	
Selenium#	7782-49-2	mg/kg	<2.6	0.979	0.363 J	2.7	6.64	---	---	---	1.12	0.832	0.854	<1.3	1.42	1.22	12.8	0.625	6.74 J	2.67 J	---	---	---	---	---	---	---	
Silver#	7440-22-4	mg/kg	<0.42	0.215 J	<0.044	0.299 J	0.0563 J	---	---	---	<0.043	0.0561 J	0.0506 J	<0.22	0.103 J	0.584	1.32	<0.042	1.07	0.303 J	---	---	---	---	---	---	---	
Thallium	7440-28-0	mg/kg	<0.74	0.159 U	0.267 U	0.165 U	0.173 U	---	---	---	0.232 J	0.11 J	0.0853 J	<0.38	<0.074	0.0779 J	0.144 U	0.177 J	0.0897 J	<0.071	---	---	---	---	---	---	---	
Vanadium#	7440-62-2	mg/kg	23.6	25.4	23	17.7	19.2	---	---	---	14.7	21.2	16.7	18.9	9.05	8.33	13.6	7.71	8.18	8.84	---	---	---	---	---	---	---	
Zinc#	7440-66-6	mg/kg	111	887	68.1	794	259	---	---	---	22.9	17	16	145	160	688	1570	10.9	394	---	---	---	---	---	---	---		
Mercury#	7439-97-6	mg/kg	0.142	1.2	0.0595	4	0.195	0.35	0.285	0.218	0.99	0.0426	0.014	21.9	23.1	3.45	7.9	0.00585	13.9 J	31.1 J	0.0167	0.0133	3.47	0.0365	0.00414	0.00226 J	0.0243 J	0.00985 J
Cyanide#	57-12-5	mg/kg	<0.62	0.941 J	<0.66	0.715 J	<0.64	---	---	---	<0.67	<0.71	<0.65	<0.64	<0.67	<0.68	<0.67	<0.68	<0.68	---	---	---	---	---	---	---	---	
PESTICIDES and PCBs																												

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			NPSS08 0-0.5 ft	WSS05 0-0.5 ft	WSS06 0-0.5 ft	WSS07 0-0.5 ft	WSS08 0-0.5 ft	WSS10 0-0.5 ft	WSS11 0-0.5 ft	WSS11 0-0.5 ft	ENSB01 1-2 ft	ENSB02 1-2 ft	ENSB03 1-2 ft	ENSB04 1-2 ft	ENSB05 1-2 ft	ENSB06 1-2 ft	ENSB07 1-2 ft	ENSB08 1-2 ft	ENSB09 1-2 ft	ENSB09 1-2 ft	ENSB10 1-2 ft	ENSB11 1-2 ft	ENSB12 1-2 ft	ENSB13 1-2 ft	ENSB14 1-2 ft	ENSB15 1-2 ft	ENSB16 1-2 ft	ENSB16 1-2 ft	
Sample Depth	CAS No.	Units	10/13/2010	10/7/2010	10/8/2010	10/7/2010	10/8/2010	12/14/2011	12/14/2011	12/14/2011	11/8/2010	11/8/2010	11/8/2010	12/9/2010	11/8/2010	11/9/2010	12/8/2010	11/9/2010	11/9/2010	11/9/2010	1/4/2012	1/4/2012	12/3/2012	12/3/2012	12/3/2012	12/3/2012			
Analyte																													
Chloroethane	75-00-3	mg/kg	<0.00098	<0.001	<0.0011	<0.0011	<0.0014	---	---	---	<0.0011	<0.00091	<0.0009	<0.00095	<0.0009	<0.00086	<0.00096	<0.00091	<0.0011	<0.00092	---	---	---	---	---	---	---	---	
Chloroform	67-66-3	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Chloromethane	74-87-3	mg/kg	<0.00098	<0.001	<0.0011	<0.0014	<0.001	---	---	---	<0.0011	<0.00091	<0.0009	<0.00095	<0.0009	<0.00086	<0.00096	<0.00091	<0.0011	<0.00092	---	---	---	---	---	---	---	---	
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Cyclohexane	110-82-7	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	0.022	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Dibromochloromethane	124-48-1	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Ethylbenzene	100-41-4	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	0.0222 JL	<0.00045	<0.00043	<0.00048	0.17	<0.00053	<0.00046	<0.00092	<0.00091	---	---	---	---	---	---	---	---
Isopropylbenzene	98-82-8	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047 JL	<0.00045	<0.00043	<0.00048	0.013	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Methyl acetate	79-20-9	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Methylcyclohexane	108-87-2	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047 JL	<0.00045	<0.00043	<0.00048	0.047	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Methylene chloride	75-09-2	mg/kg	<0.00098	0.0034 JL	0.0021 J	0.0025 U	0.0017 J	---	---	---	<0.0011	<0.00091	<0.0009	<0.00095	<0.0009	<0.00086	<0.00096	<0.00091	<0.0011	<0.00092	---	---	---	---	---	---	---	---	
Naphthalene	91-20-3	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	0.0016 U	0.0012 U	0.0011 U	<0.00047 JL	0.0012 U	<0.00043	<0.00048	<0.00046	0.0024 U	0.0013 U	---	---	---	---	---	---	---	---	
n-Butylbenzene	104-51-8	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
n-Propylbenzene	103-65-1	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047 JL	<0.00045	<0.00043	<0.00048	0.039	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
sec-Butylbenzene	135-98-8	mg/kg	<0.00049	<0.0005 JL	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047 JL	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
Styrene	100-42-5	mg/kg	<0.00049	<0.0005	<0.00053	<0.00055	<0.00072	---	---	---	<0.00055	<0.00045	<0.00045	<0.00047 JL	<0.00045	<0.00043	<0.00048	<0.00046	<0.00053	<0.00046	---	---	---	---	---	---	---	---	
tert-Butylbenzene	98-06-6	mg/kg	<0.00049	<0.0005 JL	<0.0																								

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			NPSS08 0-0.5 ft	WSS05 0-0.5 ft	WSS06 0-0.5 ft	WSS07 0-0.5 ft	WSS08 0-0.5 ft	WSS10 0-0.5 ft	WSS11 0-0.5 ft	WSS11 0-0.5 ft	ENSB01 1-2 ft	ENSB02 1-2 ft	ENSB03 1-2 ft	ENSB04 1-2 ft	ENSB05 1-2 ft	ENSB06 1-2 ft	ENSB07 1-2 ft	ENSB08 1-2 ft	ENSB09 1-2 ft	ENSB09 1-2 ft	ENSB10 1-2 ft	ENSB11 1-2 ft	ENSB12 1-2 ft	ENSB13 1-2 ft	ENSB14 1-2 ft	ENSB15 1-2 ft	ENSB16 1-2 ft	ENSB16 1-2 ft	
Sample Depth	CAS No.	Units	10/13/2010	10/7/2010	10/8/2010	10/7/2010	10/8/2010	12/14/2011	12/14/2011	12/14/2011	11/8/2010	11/8/2010	11/8/2010	12/9/2010	11/8/2010	11/9/2010	12/8/2010	11/9/2010	11/9/2010	11/9/2010	1/4/2012	1/4/2012	12/3/2012	12/3/2012	12/3/2012	12/3/2012	12/3/2012		
Sample Date																													
Analyte																													
Dimethyl phthalate	131-11-3	mg/kg	<0.04 JL	<0.0026	<0.028	<0.0025	<0.028	---	---	---	<0.0029	<0.0029	<0.0028	<0.0027	<0.0029	<0.0027	<0.0028	<0.0028	<0.0028	---	---	---	---	---	---	---	---	---	
Di-n-butyl phthalate	84-74-2	mg/kg	<0.042 JL	0.011	<0.03	<0.0026	<0.029	---	---	---	<0.003	<0.003	<0.0029	0.007 J	<0.003	0.021 U	<0.0029	0.0068 U	<0.0029 J	0.049 U	---	---	---	---	---	---	---	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	<0.048 JL	<0.0032	<0.034	<0.003	<0.033	---	---	---	<0.0035	<0.0035	<0.0033	0.0075	<0.0035	<0.0033	<0.0033	<0.0034	0.015	<0.0033	---	---	---	---	---	---	---	---	---
Fluoranthene	206-44-0	mg/kg	0.085 JL	0.16	0.51	0.024	0.15	---	---	---	0.28	<0.0027	<0.0025	0.063	0.035	0.044	0.067	0.81	0.081 J	0.037 J	---	---	---	---	---	---	---	---	---
Fluorene	86-73-7	mg/kg	<0.037 JL	0.0026 J	<0.026	<0.0023	<0.025	---	---	---	0.011	<0.0027	<0.0025	<0.0025	<0.0026	<0.0025	0.0038 J	0.0093	0.0077 J	<0.0025 J	---	---	---	---	---	---	---	---	---
Hexachlorobenzene	118-74-1	mg/kg	<0.043 JL	<0.0029	<0.031	<0.0027	<0.03	---	---	---	<0.0031	<0.0032	<0.003	<0.0029	<0.0031	<0.0029	<0.003	<0.0031	<0.003	<0.003	---	---	---	---	---	---	---	---	---
Hexachlorobutadiene	87-68-3	mg/kg	<0.073 JL	<0.0048	<0.052	<0.0046	<0.051	---	---	---	<0.0053	<0.0053	<0.0051	<0.005	<0.0052	<0.005	<0.0051	<0.0052	<0.0051	<0.0051	---	---	---	---	---	---	---	---	---
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.06 JL	<0.004 JL	<0.043	<0.0037	<0.041	---	---	---	<0.0043	<0.0044	<0.0042	<0.0041	<0.0043	<0.0041	<0.0041	<0.0042	<0.0041	<0.0041	---	---	---	---	---	---	---	---	---
Hexachloroethane	67-72-1	mg/kg	<0.065 JL	<0.0043	<0.046	<0.0041	<0.045	---	---	---	<0.0047	<0.0047	<0.0045	<0.0044	<0.0046	<0.0044	<0.0045	<0.0045	<0.0045	<0.0045	---	---	---	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	<0.058 JL	0.061	0.15	0.01	0.071 J	---	---	---	0.062	<0.0042	<0.004	0.02	0.067	0.016	0.024	0.44	0.031	0.022	---	---	---	---	---	---	---	---	---
Isophorone	78-59-1	mg/kg	<0.05 JL	<0.0033	<0.036	<0.0031	<0.035	---	---	---	<0.0036	<0.0036	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0035	<0.0035	<0.0035	---	---	---	---	---	---	---	---	---
Naphthalene	91-20-3	mg/kg	<0.055 JL	<0.0036	<0.039	<0.0034	<0.038	---	---	---	<0.004	<0.004	<0.0038	<0.0037	<0.0039	<0.0037	0.0084 U	0.0089	0.0045 J	<0.0038	---	---	---	---	---	---	---	---	---
Nitrobenzene	98-95-3	mg/kg	<0.055 JL	<0.0036	<0.039	<0.0034	<0.038	---	---	---	<0.004	<0.004	<0.0038	<0.0037	<0.0039	<0.0037	<0.0038	<0.0039	<0.0039	<0.0038	---	---	---	---	---	---	---	---	---
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.066 JL	<0.0044	<0.047	<0.0042	<0.046	---	---	---	<0.0048	<0.0049	<0.0046	<0.0045	<0.0048	<0.0045	<0.0046	<0.0047	<0.0046	<0.0046	---	---	---	---	---	---	---	---	---
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.037 JL	<0.0024	<0.026	<0.0023	<0.025	---	---	---	<0.0026	<0.0027	<0.0025	<0.0025	<0.0026	<0.0025	<0.0026	<0.0026	<0.0026	0.0067 J	<0.0025	---	---	---	---	---	---	---	---
Pentachlorophenol#	87-86-5	mg/kg	<0.047	<0.0031	<0.033	<0.0029	<0.032 JL	---	---	---	<0.0034 JL	<0.0034 JL	<0.0032 JL	0.012	<0.0033 JL	<0.0032 JL	<0.0032 JL	<0.0033 JL	<0.0032 JL	<0.0032 JL	---	---	---	---	---	---	---	---	---
Phenanthrene	85-01-8	mg/kg	<0.05 JL	0.044	0.079	0.0066 J	0.043 J	---	---	---	0.14	<0.0036	<0.0035	0.017	0.02	0.018	0.057	0.13	0.058 J	0.015 J	---	---	---	---	---	---	---	---	---
Phenol	108-95-2	mg/kg	<0.055	<0.0036	<0.039	<0.0034	<0.038 JL	---	---	---	<0.004 JL	<0.004 JL	<0.0038 JL	0.0052 J	<0.0039 JL	<0.0037 JL	0.037 J L	0.0062 J	<0.0038	<0.0038	---	---	---	---	---	---	---	---	---
Pyrene	129-00-0	mg/kg	0.08 JL	0.13	0.47	0.02	0.13	---	---	---	0.23	<0.0027	<0.0025	0.057	0.057	0.033	0.17	0.71	0.07										

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENSB17 1-2 ft 12/3/2012	ESSB09 1-2 ft 1/10/2012	NPSB01 1-2 ft 11/11/2010	NPSB02 1-2 ft 11/11/2010	NPSB03 1-2 ft 11/11/2010	NPSB04 1-2 ft 11/10/2010	NPSB04 1-2 ft 11/10/2010	NPSB05 1-2 ft 11/11/2010	NPSB06 1-2 ft 11/10/2010	NPSB07 1-2 ft 11/9/2010	NPSB08 1-2 ft 11/10/2010	NPSB09 1-2 ft 11/10/2010	NPSB10 1-2 ft 1/12/2012	NPSB11 1-2 ft 1/18/2012	NPSB12 1-2 ft 1/25/2012	WSB05 1-2 ft 11/3/2010	WSB06 1-2 ft 12/6/2010	WSB07 1-2 ft 11/2/2010	WSB08 1-2 ft 11/2/2010	WSB08 1-2 ft 11/2/2010	WSB10 1-2 ft 12/4/2012	WSB11 1-2 ft 12/4/2012			
Analyte	CAS No.	Units																									
METALS																											
Aluminum#	7429-90-5	mg/kg	---	7410	10900	10800	12100	11400	10100	10200	12100	6990	6730	8880	9420	8780	6540 JL	9020	14900	7750	4060	4120	---	---	---	---	
Antimony	7440-36-0	mg/kg	---	0.542	<0.29	<0.25	0.614	<0.28	<0.25	<0.26	<0.27	0.825	<0.25	0.288 J	<0.2	<0.21	<0.19	<0.28	0.338 J	<0.26	<0.27	---	---	---	---		
Arsenic#	7440-38-2	mg/kg	6	9.8	2.14	12.6	27.2	5.06	7.15	5.67	32.3	6.28	11.1	7.95	8.81	3.33	3.86	4.39	13.8	2.38	1.41	4.7	2.96	---	---		
Barium#	7440-39-3	mg/kg	---	200	417	160	337	270	240	281	311	1070	283	423	179	186	259	274	211	256	286	---	---	---	---		
Beryllium	7440-41-7	mg/kg	---	0.499 J	0.579 J	0.693	0.639	0.62	0.594	0.573	0.57	0.525 J	0.361 J	0.504 J	0.64	0.627	0.33 J	0.597 J	0.764	0.537 J	0.255 J	<0.27	---	---	---		
Cadmium#	7440-43-9	mg/kg	---	26.3	0.229 J	0.239 J	32.6	0.428 J	1.37	26	9.33	67.2	5.94	37.4	23.8	0.423 J	0.409 J	0.237 J	0.209 J	31.9	0.179 J	0.154 J	---	---	---	---	
Chromium#	7440-47-3	mg/kg	---	8.51	6.78	7.03	8.64	6.27	6.16	8.31	6.89	6.42	8.18	8.02	12.2	6.23	6.48	5.57	10.6	8.81	3.92	3.12	---	---	---	---	
Cobalt	7440-48-4	mg/kg	---	4.21	3.37	3.58	5.29	4.37	4.42	4.77	9.28	4.21	11.3	7.43	4.21	3.05	3.01	5.73	8.27	1.94	1.81	---	---	---	---		
Copper#	7440-50-8	mg/kg	---	82.6	6.37	5.61	57.7	6.31	7.41	84.2	15	475	28.9	66.9	54.5	6.26	15.3	6.77	7.42	106	5.37	3.84	---	---	---	---	
Lead#	7439-92-1	mg/kg	---	227	12.3	10	375	9.07 J	18.9 J	168	52.3	858	92.7	183	110	14.3	61.6	10.1	11.1	209	8.48	8.06	---	---	---	---	
Manganese#	7439-96-5	mg/kg	---	422	136	245	584	307	275	323	377	352	451	297	272	192	155	369	439	123	150	---	---	---	---		
Nickel#	7440-02-0	mg/kg	---	7.82	5.82	6.66	10.6	6.59	6.28	7.1	6.65	7.26	6.24	6.7	7.24	5.91	6.17	6.7	8.73	7	3.37	3.11	---	---	---	---	
Selenium#	7782-49-2	mg/kg	---	8.46	1.09	0.995	4.27	1.36	3.15	2.32	5.06	3.75	3.89	3.27	1.35	0.364 U	0.879	0.778	3.28	0.446 J	0.861	---	---	---	---		
Silver#	7440-22-4	mg/kg	---	2.09	0.053 J	<0.041	3.82	0.053 J	0.197 J	2.47	0.556	10.2	0.766	1.31	0.777	<0.086	<0.078	<0.23	<0.045	1.87	0.0548 J	<0.21	---	---	---	---	
Thallium	7440-28-0	mg/kg	---	0.234 J	0.103 J	0.234 J	0.153 J	0.13 J	0.124 J	0.139 J	0.127 J	<0.16	0.142 J	<0.15	0.155 J	0.178 U	0.182 J	0.13 J	0.201 J	0.149 J	0.116 J	0.0969 J	---	---	---	---	
Vanadium#	7440-62-2	mg/kg	---	15.1	11	16.6	25.4	19.3	16	14.2	22.6	20.6	12.6	14.3	18.8	12.9	12.5	9.32	25	19.4	10.9	9.48	---	---	---	---	
Zinc#	7440-66-6	mg/kg	---	2160	37.2	39	1500	31.2 J	64.5 J	2520	485	13700	969	1840	1110	28.2	51.3	25.4	54.3	2280	68.9	61.9	---	---	---	---	
Mercury#	7439-97-6	mg/kg	0.0265	58.1	0.0452	0.0352	1.66	0.152	0.149	7.85	0.593	8.3	4.42	11	13.2	0.58	0.0383	0.025	0.0272	3.68	0.0461	0.0393	0.00472	0.00914	---	---	
Cyanide#	57-12-5	mg/kg	---	<0.66	<0.72	<0.67	<0.72	<0.69	<0.68	<0.72	<0.73	<0.67	<0.69	<0.69	<0.65	2.3	<0.72	<0.71	<0.67	<0.67	---	---	---	---	---	---	
PESTICIDES and PCBs																											
4,4'-DDD#	72-54-8	mg/kg	---	<0.0028	<0.0006	<0.0028	<0.00061	<0.00058	<0.00058	<0.00029	<0.0031	<0.0031	<0.00057	<0.003	<0.00058	<0.00058	<0.0054	<0.00058	<0.00061	<0.006	<0.00056	<0.0056	---	---	---	---	
4,4'-DDE	72-55-9	mg/kg	---	<0.0028	<0.0006	<0.0028	<0.00061	<0.00058	<0.00058	<0.00029	<0.0031	<0.0031	<0.00057	<0.003	<0.00058	<0.00057	<0.0054	<0.00058	<0.00061	<0.006	<0.00056	<0.0056	---	---	---	---	
4,4'-DDT#	50-29-3	mg/kg	---	<0.0028	<0.0006	<0.0028	<0.00061	<0.00058	<0.00058	<0.00029	<0.0031	<0.0031	0.019 J	<0.003	<0.00058	<0.00057	<0.0054	<0.00058	<0.00061	<0.006	<0.00056	<0.0056	---	---	---	---	
Aldrin#	309-00-2	mg/kg	---	<0.0017	<0.00036	<0.0017	<0.00037	<0.00035	<0.0003																		

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENS B17 1-2 ft 12/3/2012	ESS B09 1-2 ft 1/10/2012	NPS B01 1-2 ft 11/11/2010	NPS B02 1-2 ft 11/11/2010	NPS B03 1-2 ft 11/11/2010	NPS B04 1-2 ft 11/10/2010	NPS B05 1-2 ft 11/10/2010	NPS B06 1-2 ft 11/10/2010	NPS B07 1-2 ft 11/9/2010	NPS B08 1-2 ft 11/10/2010	NPS B09 1-2 ft 11/10/2010	NPS B10 1-2 ft 1/12/2012	NPS B11 1-2 ft 1/18/2012	NPS B12 1-2 ft 1/25/2012	WSB 05 1-2 ft 11/3/2010	WSB 06 1-2 ft 12/6/2010	WSB 07 1-2 ft 11/2/2010	WSB 08 1-2 ft 11/2/2010	WSB 09 1-2 ft 11/2/2010	WSB 10 1-2 ft 12/4/2012	WSB 11 1-2 ft 12/4/2012	
Analyte	CAS No.	Units																						
Chloroethane	75-00-3	mg/kg	---	<0.0013	<0.00097	<0.00088	<0.00092	<0.00086	<0.00084	<0.00087	<0.001	<0.00093	<0.00093	<0.00091	<0.00092	<0.0014	<0.00094	<0.00085	<0.00094	<0.00098	<0.001	<0.00093	---	---
Chloroform	67-66-3	mg/kg	---	<0.0023	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0017	<0.0026	<0.0017	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Chloromethane	74-87-3	mg/kg	---	<0.0011	<0.00097	<0.00088	<0.00092	<0.00086	<0.00084	<0.00087	<0.001	<0.00093	<0.00093	<0.00091	<0.00083	<0.0013	<0.00085	<0.00085	<0.00094	<0.00098	<0.001	<0.00093	---	---
cis-1,2-Dichlorethene	156-59-2	mg/kg	---	<0.0019	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0014	<0.0021	<0.0014	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
cis-1,3-Dichloropropene	10061-01-5	mg/kg	---	<0.00063	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00046	<0.00071	<0.00042	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Cyclohexane	110-82-7	mg/kg	---	<0.0015	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0011	<0.0017	<0.0011	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Dibromochloromethane	124-48-1	mg/kg	---	<0.00063	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00046	<0.00071	<0.00047	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Dichlorodifluoromethane	75-71-8	mg/kg	---	<0.0023	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0017	<0.0026	<0.0017	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Ethylbenzene	100-41-4	mg/kg	---	<0.0011	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00083	<0.0013	<0.00085	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Isopropylbenzene	98-82-8	mg/kg	---	<0.0013	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00051	<0.00047	<0.00047	<0.00046	<0.00092	<0.0014	<0.00094	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---	
Methyl acetate	79-20-9	mg/kg	---	<0.0013	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00092	<0.0014	<0.00094	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Methyl tert-butyl ether	1634-04-4	mg/kg	---	<0.0024	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0017	<0.0027	<0.0018	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Methylcyclohexane	108-87-2	mg/kg	---	0.0022 J	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.0014	<0.0021	<0.0014	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
Methylene chloride	75-09-2	mg/kg	---	<0.0031	0.0016 U	<0.00088	<0.00086	<0.00084	<0.00087	<0.001	<0.00093	<0.00093	<0.00091	0.0055 J	<0.0036	<0.0024	<0.00085	<0.00094	<0.00098	0.0011 J	<0.00093	---	---	
Naphthalene	91-20-3	mg/kg	---	0.006 J	<0.00048	<0.00046	<0.00046	0.0011 U	0.001 U	0.0013 U	0.0017 U	0.0012 U	0.0013 U	<0.00046	<0.00073	<0.0011	<0.00076	<0.00042	<0.00047	0.0028 J	<0.00051	<0.00047	---	---
n-Butylbenzene	104-51-8	mg/kg	---	<0.00075	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00051	<0.00047	<0.00047	<0.00046	<0.00055	<0.00085	<0.00057	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---	
n-Propylbenzene	103-65-1	mg/kg	---	<0.0011	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00083	<0.0013	<0.00085	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---
sec-Butylbenzene	135-98-8	mg/kg	---	<0.00075	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00043	<0.00051	<0.00047	<0.00047	<0.00046	<0.00055	<0.00057	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---	
Styrene	100-42-5	mg/kg	---	<0.00075	<0.00048	<0.00044	<0.00046	<0.00043	<0.00042	<0.00051	<0.00047	<0.00047	<0.00046	<0.00055	<0.00057	<0.00042	<0.00047	<0.00049	<0.00051	<0.00047	---	---		
tert-Butylbenzene	98-06-6	mg/kg	---	<0.00075	<0.00048	<0.00046	<0.00043	<0.00042	<0.00051	<0.00047	<0.00047	<0.00046	<0.00055	<0.00085	<0.00057	<0.00042	<0.00047</							

Soil Analytical Data Summary - North Area
Brine Services Company Superfund Site

Sample Location			ENS B17 1-2 ft 12/3/2012	ESS B09 1-2 ft 1/10/2012	NPS B01 1-2 ft 11/11/2010	NPS B02 1-2 ft 11/11/2010	NPS B03 1-2 ft 11/11/2010	NPS B04 1-2 ft 11/10/2010	NPS B05 1-2 ft 11/11/2010	NPS B06 1-2 ft 11/10/2010	NPS B07 1-2 ft 11/9/2010	NPS B08 1-2 ft 11/10/2010	NPS B09 1-2 ft 11/10/2010	NPS B10 1-2 ft 1/12/2012	NPS B11 1-2 ft 1/18/2012	NPS B12 1-2 ft 1/25/2012	WS B05 1-2 ft 11/3/2010	WS B06 1-2 ft 12/6/2010	WS B07 1-2 ft 11/2/2010	WS B08 1-2 ft 11/2/2010	WS B09 1-2 ft 12/4/2012	WS B10 1-2 ft 11/2/2010	WS B11 1-2 ft 12/4/2012	
Analyte	CAS No.	Units																						
Dimethyl phthalate	131-11-3	mg/kg	---	<0.0022	<0.0029	<0.0027	<0.0029	<0.0028	<0.0028	<0.003	<0.003	<0.0027	<0.0029	<0.0023	<0.0023	<0.022	<0.0028	<0.0029	<0.0029	<0.0027	---	---		
Di-n-butyl phthalate	84-74-2	mg/kg	---	<0.0022	<0.003	0.0036 U	<0.003	<0.0029	0.0029 U	<0.0029	<0.0031	<0.0031	0.0046 U	<0.003	<0.0023	<0.0023	0.039 U	<0.0029	<0.003	<0.003	<0.0028	0.0037 U	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	---	<0.0022	<0.0035	<0.0033	<0.0035	<0.0034	<0.0033	<0.0036	<0.0033	<0.0035	<0.0023	<0.0023	<0.022	<0.0034	<0.0035	<0.0035	<0.0032	<0.0033	---	---		
Fluoranthene	206-44-0	mg/kg	---	0.029	0.0061 J	0.011	0.006 J	0.014	0.02	0.21	0.031	0.17	0.013	0.069	0.013	0.19	0.0051 J	0.0039 J	0.55	0.25	0.15	---	---	
Fluorene	86-73-7	mg/kg	---	<0.0018	<0.0027	<0.0025	<0.0027	<0.0025	<0.0026	0.0052 J	<0.0027	0.0037 J	<0.0025	0.0028 J	<0.0018	<0.0018	<0.017	<0.0026	<0.0027	0.023	0.02	0.013	---	---
Hexachlorobenzene	118-74-1	mg/kg	---	<0.0018	<0.0031	<0.0029	<0.0032	<0.003	<0.003	<0.0032	<0.0032	<0.003	<0.0018	<0.0018	<0.017	<0.003	<0.0032	<0.0031	<0.0029	<0.0029	---	---		
Hexachlorobutadiene	87-68-3	mg/kg	---	<0.0018	<0.0053	<0.005	<0.0054	<0.0051	<0.0051	<0.0055	<0.0054	<0.005	<0.0053	<0.0018	<0.0018	<0.017	<0.0051	<0.0054	<0.0053	<0.0049	<0.0049	---	---	
Hexachlorocyclopentadiene	77-47-4	mg/kg	---	<0.0018	<0.0043	<0.0041	<0.0044	<0.0042	<0.0041	<0.0045	<0.0044	<0.0044	<0.0041	<0.0043	<0.0018	<0.017	<0.0042	<0.0044	<0.0043	<0.004	<0.004	---	---	
Hexachloroethane	67-72-1	mg/kg	---	<0.0018	<0.0047	<0.0044	<0.0048	<0.0045	<0.0045	<0.0048	<0.0048	<0.0045	<0.0047	<0.0018	<0.017	<0.0045	<0.0047	<0.0047	<0.0043	<0.0043	<0.0044	---	---	
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	---	0.017	<0.0042	<0.0039	<0.0043	0.057 J	<0.0041 J	0.068	0.013	0.041	<0.004	<0.0042	0.03	0.0075 J	0.087	<0.0041	<0.0043	0.15	0.065	0.043	---	---
Isophorone	78-59-1	mg/kg	---	<0.0018	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0036	<0.0018	<0.0018	<0.017	<0.0035	<0.0037	<0.0036	<0.0033	<0.0034	---	---	
Naphthalene	91-20-3	mg/kg	---	<0.0018	<0.004	<0.0037	<0.004	<0.0038	<0.0038	<0.0038	<0.0041	<0.0041	<0.0038	<0.004	0.0023 J	<0.0018	<0.017	<0.0038	<0.004	0.012	0.0051 J	0.0045 J	---	---
Nitrobenzene	98-95-3	mg/kg	---	<0.0018	<0.004	<0.004	<0.0037	<0.004	<0.0038	<0.0038	<0.0041	<0.0041	<0.0038	<0.004	<0.0018	<0.017	<0.0038	<0.004	<0.0037	<0.0037	<0.0037	---	---	
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	---	<0.0022	<0.0048	<0.0045	<0.0049	<0.0046	<0.0046	<0.0046	<0.0046	<0.005	<0.0049	<0.0046	<0.0048	<0.0023	<0.022	<0.0047	<0.0049	<0.0048	<0.0045	<0.0045	---	---
N-Nitrosodiphenylamine	86-30-6	mg/kg	---	<0.0022	<0.0027	<0.0025	<0.0027	<0.0025	<0.0026	<0.0025	<0.0027	<0.0027	<0.0025	<0.0026	<0.0023	<0.022	<0.0026	<0.0027	<0.0026	<0.0025	<0.0025	---	---	
Pentachlorophenol#	87-86-5	mg/kg	---	<0.002	<0.0034 JL	<0.0032 JL	<0.0034 JL	<0.0032 JL	<0.0032 JL	<0.0032 JL	<0.0035 JL	<0.0034 JL	<0.0034 JL	<0.0034 JL	<0.0021	<0.021	<0.019	<0.0033 JL	<0.0034	<0.0034	<0.0031	<0.0031	---	---
Phenanthrene	85-01-8	mg/kg	---	0.012	0.0062 J	<0.0034	<0.0037	<0.0035	0.0082	0.036	0.01	0.055	0.0057 J	0.031	0.0059 J	0.097	0.0042 J	<0.0037	0.3	0.18	0.11	---	---	
Phenol	108-95-2	mg/kg	---	<0.0022	<0.004	<0.0037	<0.004	<0.0038	<0.0038	<0.0038	<0.0041	<0.0041	<0.0038	<0.004	<0.0023	<0.022	<0.0038 JL	<0.004	<0.004	<0.0037	<0.0037	---	---	
Pyrene	129-00-0	mg/kg	---	0.024	0.0058 J	0.0089	0.0054 J	0.014	0.016	0.19	0.026	0.15	0.015	0.066	0.06	0.012	0.14	0.0052 J	0.0053 J	0.29	0.19 J	0.11 J	---	---
Low Molecular Weight PAHs	LPAH	mg/kg	---	0.0247	0.0243	0.0201	0.0218	0.0204	0.027	0.151	0.0295	0.1183	0.0226	0.0527	0.0438	0.0124	0.1725	0.0217	0.0218	0.4609	0.2752	0.1755	---	---
High Molecular Weight PAHs#	HPAH	mg/kg	---	0.1081	0.0248	0.0382	0.0248	0.1545	0.0804	0.8325	0.1137	0.5477	0.0582	0.2906	0.245	0.0538	0.596	0.0243	0.0216	1.594</				

Surface Water Data Summary
South Portion (Freshwater) East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	T/D	Units	Sample Location		EDSW01	EDSW01	EDSW02	EDSW03	EDSW-011717
				Sample Date		11/18/2010	11/18/2010	11/18/2010	11/18/2010	1/17/2017
Hardness	HARD	T	mg/l	164		190	185	138	387	
Conductivity	COND	T	umhos/cm	--		--	--	--	1940	
Salinity	SAL	T	ppt	0.486		--	0.273	0.448	< 2	
Chloride	16887-00-6	T	mg/l	130		127	3410	7660	409	
METALS										
Aluminum#	7429-90-5	T	mg/l	1.32		1.38	3.37	6.95	0.147	
Aluminum#	7429-90-5	D	mg/l	0.505		0.517	1.12	0.446	--	
Antimony	7440-36-0	T	mg/l	0.000853 J		0.000607 J	0.000819 J	0.000874 J	0.00106 J	
Arsenic	7440-38-2	T	mg/l	0.00505		0.00514	0.0091	0.00619	0.00390 J	
Barium	7440-39-3	T	mg/l	0.236		0.256	0.253	0.254	0.301	
Beryllium	7440-41-7	T	mg/l	<0.0003		0.000507 J	<0.0003	<0.0003	<0.0002	
Cadmium	7440-43-9	D	mg/l	<0.0006		<0.0006	<0.0006	<0.0006	<0.0002	
Chromium	7440-47-3	D	mg/l	0.000759 J		0.000936 J	0.00116 J	0.000911 J	<0.0004	
Cobalt	7440-48-4	T	mg/l	0.000733 J		0.000672 J	0.00126 J	0.00244 J	0.000740 J	
Copper	7440-50-8	D	mg/l	0.00316 J		0.00354 J	0.00479 J	0.0036 J	0.00415	
Lead	7439-92-1	D	mg/l	0.00122 J		0.00125 J	0.00133 J	0.000612 J	<0.0006	
Manganese#	7439-96-5	T	mg/l	0.0507		0.0558	0.0669	0.187	0.391	
Nickel	7440-02-0	D	mg/l	0.00229 J		0.00252 J	0.00286 J	0.00293 J	0.00194 J	
Selenium	7782-49-2	T	mg/l	<0.0025		<0.0025	<0.0025	<0.0025	<0.0011	
Silver	7440-22-4	D	mg/l	<0.0007		<0.0007	<0.0007	<0.0007	<0.0002	
Thallium	7440-28-0	T	mg/l	<0.0008		<0.0008	<0.0008	<0.0008	<0.0002	
Vanadium	7440-62-2	T	mg/l	0.00744		0.00902	0.00994	0.0103	0.00686 J	
Zinc	7440-66-6	D	mg/l	0.0041 J		0.00806	0.00943	0.00254 J	0.0108	
Mercury	7439-97-6	T	mg/l	<4.2e-005		<4.2e-005	<4.2e-005	<4.2e-005	<3.0E-05	
Cyanide	57-12-5	T	mg/l	0.005 J		<0.004	<0.004	<0.004	--	
PESTICIDES AND PCBs										
4,4'-DDD	72-54-8	N	mg/l	0.0000027		<2.5e-006	0.0000042	<2.5e-006	--	
4,4'-DDE	72-55-9	N	mg/l	0.0000066		0.0000055	6e-006 J	<2.5e-006	--	
4,4'-DDT#	50-29-3	N	mg/l	<2.5e-006		<2.5e-006	1.1e-005 J	<2.5e-006 J	--	
Aldrin	309-00-2	N	mg/l	5.5e-006 J		2.1e-006 J	2.2e-006 J	2.5e-006 J	--	
alpha-BHC	319-84-6	N	mg/l	<1.2e-006 J		<1.2e-006	<1.2e-006	<1.2e-006	--	
alpha-Chlordane	5103-71-9	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
beta-BHC	319-85-7	N	mg/l	<1.2e-006		<1.2e-006	<1.2e-006	<1.2e-006	--	
delta-BHC	319-86-8	N	mg/l	<1.2e-006		<1.2e-006	<1.2e-006	<1.2e-006	--	
Dieldrin	60-57-1	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
Endosulfan I	959-98-8	N	mg/l	2.9e-006 J		2.4e-006 J	4.7e-006 J	3.3e-006 J	--	
Endosulfan II	33213-65-9	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
Endosulfan sulfate	1031-07-8	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
Endrin	72-20-8	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
Endrin aldehyde	7421-93-4	N	mg/l	<2.5e-006		<2.5e-006	<2.5e-006	<2.5e-006	--	
gamma-BHC	58-89-9	N	mg/l	<1.2e-006		<1.2e-006	<1.2e-006	<1.2e-006 J	--	
gamma-Chlordane#	5103-74-2	N	mg/l	7.50E-06		8.30E-06	7.70E-06	<2.5e-006 J	--	
Heptachlor#	76-44-8	N	mg/l	0.0000033		0.0000025	2.3e-006 J	4.1e-006 J	--	
Heptachlor epoxide	1024-57-3	N	mg/l	<1.2e-006		<1.2e-006	<1.2e-006	<1.2e-006	--	
Methoxychlor	72-43-5	N	mg/l	<1.2e-005		<1.2e-005	<1.2e-005	<1.2e-005	--	
Toxaphene	8001-35-2	N	mg/l	<2.5e-005		<2.5e-005	<2.5e-005	<2.5e-005	--	
Aroclor 1016	12674-11-2	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	
Aroclor 1221	11104-28-2	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	
Aroclor 1232	11141-16-5	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	
Aroclor 1242	53469-21-9	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	--
Aroclor 1248	12672-29-6	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	--
Aroclor 1254	11097-69-1	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	--
Aroclor 1260	11096-82-5	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	--
VOLATILE ORGANIC COMPOUNDS										
1,1,1,2-Tetrachloroethane	630-20-6	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0003	
1,1,1-Trichloroethane	71-55-6	N	mg/l	<0.0001		<0.0001	<0.0001	<0.0001	<0.0002	
1,1,2,2-Tetrachloroethane	79-34-5	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0005	
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	N	mg/l	<0.0001		<0.0001	<0.0001	<0.0001	<0.0010	
1,1,2-Trichloroethane	79-00-5	N	mg/l	<0.0001		<0.0001	<0.0001	<0.0001	<0.0003	
1,1-Dichloroethane	75-34-3	N	mg/l	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	
1,1-Dichloroethene	75-35-4	N	mg/l	<0.0002		<0.0002	<0.0002	&		

Surface Water Data Summary
South Portion (Freshwater) East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	T/D	Units	Sample Location		EDSW01	EDSW01	EDSW02	EDSW03	EDSW-011717
				Sample Date	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	1/17/2017
Chloroethane	75-00-3	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Chloroform	67-66-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002
Chloromethane	74-87-3	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,2-Dichloroethene	156-59-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,3-Dichloropropene	10061-01-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cyclohexane	110-82-7	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
Dibromochloromethane	124-48-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
Dichlorodifluoromethane	75-71-8	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003
Ethylbenzene	100-41-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003
Isopropylbenzene	98-82-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
Methyl acetate	79-20-9	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0010	<0.0010
Methyl tert-butyl ether	1634-04-4	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002
Methylcyclohexane	108-87-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003
Methylene chloride	75-09-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.001
Naphthalene	91-20-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
n-Butylbenzene	104-51-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
n-Propylbenzene	103-65-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
sec-Butylbenzene	135-98-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
Styrene	100-42-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
tert-Butylbenzene	98-06-6	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tetrachloroethene	127-18-4	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Toluene	108-88-3	N	mg/l	0.00025 J	0.00023 J	0.00025 J	<0.0001	<0.0002		
trans-1,2-Dichloroethene	156-60-5	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	<0.0002
trans-1,3-Dichloropropene	10061-02-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002
Trichloroethene	79-01-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002
Trichlorofluoromethane	75-69-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003
Vinyl chloride	75-01-4	N	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0002
Xylenes, Total	1330-20-7	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
SEMICVOLATILE ORGANIC COMPOUNDS										
1,1'-Biphenyl	92-52-4	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	<2.4E-05		
1-Methylnaphthalene	90-12-0	N	mg/l	<9e-05 JL	<9e-05	<9e-05	<9e-05 JL	<1.0E-05		
2,4,5-Trichlorophenol	95-95-4	N	mg/l	<9e-05 JL	<9e-05 JL	<9e-05	<9e-05 JL	< 5.8E-05		
2,4,6-Trichlorophenol	88-06-2	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05 JL	< 4.9E-05		
2,4-Dichlorophenol	120-83-2	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	< 4.4E-05		
2,4-Dimethylphenol	105-67-9	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	0.00021		
2,4-Dinitrophenol	51-28-5	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	< 1.0E-04		
2,4-Dinitrotoluene	121-14-2	N	mg/l	<9e-05 JL	<9e-05	<9e-05	<9e-05 JL	< 5.9E-05		
2,6-Dinitrotoluene	606-20-2	N	mg/l	<7e-05 JL	<7e-05	<7e-05	<7e-05 JL	< 4.3E-05		
2-Chloronaphthalene	91-58-7	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	< 2.1E-05		
2-Chlorophenol	95-57-8	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	< 3.7E-05		
2-Methylnaphthalene	91-57-6	N	mg/l	<7e-05 JL	<7e-05	<7e-05	<7e-05 JL	< 1.9E-05		
2-Methylphenol	95-48-7	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	< 4.6E-05		
2-Nitroaniline	88-74-4	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	< 4.2E-05		
2-Nitrophenol	88-75-5	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05 JL	< 3.5E-05		
3&4-Methylphenol	106-44-5	N	mg/l	<0.0001 JL	<0.0001 JL	<0.0001	<0.0001 JL	< 3.7E-05		
3,3'-Dichlorobenzidine	91-94-1	N	mg/l	<7e-05 JL	<7e-05	<7e-05	<7e-05 JL	< 4.5E-05 JL		
3-Nitroaniline	99-09-2	N	mg/l	<8e-05 JL	<8e-05	<8e-05	<8e-05 JL	< 5.0E-05 JL		
4,6-Dinitro-2-methylphenol	534-52-1	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05 JL	< 2.0E-05		
4-Bromophenyl phenyl ether	101-55-3	N	mg/l	<9e-05 JL	<9e-05	<9e-05	<9e-05 JL	< 5.2E-05		
4-Chloro-3-methylphenol	59-50-7	N	mg/l	<0.0001 JL	<0.0001 JL	<0.0001	<0.0001 JL	< 3.3E-05		
4-Chloroaniline	106-47-8	N	mg/l	<7e-05 JL	<7e-05	<7e-05	<7e-05 JL	< 4.0E-05 JL		
4-Chlorophenyl phenyl ether	7005-72-3	N	mg/l	<8e-05 JL	<8e-05	<8e-05	<8e-05 JL	< 4.5E-05		
4-Nitroaniline	100-01-6	N	mg/l	<7e-05 JL	<7e-05	<7e-05	<7e-05 JL	< 3.6E-05		
4-Nitrophenol	100-02-7	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05 JL	< 4.8E-05		
Acenaphthene	83-32-9	N	mg/l	<9e-05 JL	<9e-05	<9e-05	<9e-05 JL	< 2.8E-05		
Acenaphthylene	208-96-8	N	mg/l	<7e-05 JL	<7e-05	<7				

Surface Water Data Summary
South Portion (Freshwater) East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	T/D	Units	Sample Location	EDSW01	EDSW01	EDSW02	EDSW03	EDSW-011717
				Sample Date	11/18/2010	11/18/2010	11/18/2010	11/18/2010	1/17/2017
Hexachloroethane	67-72-1	N	mg/l	<0.00017 JL	<0.00017	<0.00017	<0.00017 JL	< 6.0E-05	
Indeno(1,2,3-cd)pyrene	193-39-5	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	< 2.2E-05	
Isophorone	78-59-1	N	mg/l	<7e-005 JL	<7e-005	<7e-005	<7e-005 JL	< 2.6E-05	
Naphthalene	91-20-3	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	< 2.0E-05	
Nitrobenzene	98-95-3	N	mg/l	<9e-005 JL	<9e-005	<9e-005	<9e-005 JL	< 2.4E-05	
N-Nitrosodi-n-propylamine	621-64-7	N	mg/l	<0.0001 JL	<0.0001	<0.0001	<0.0001 JL	< 3.3E-05	
N-Nitrosodiphenylamine	86-30-6	N	mg/l	<9e-005 JL	<9e-005	<9e-005	<9e-005 JL	< 2.6E-05	
Pentachlorophenol	87-86-5	N	mg/l	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL	< 8.1E-05	
Phenanthrene	85-01-8	N	mg/l	<7e-005 JL	<7e-005	<7e-005	<7e-005 JL	< 2.1E-05	
Phenol	108-95-2	N	mg/l	<7e-005 JL	<7e-005 JL	<7e-005	<7e-005 JL	< 3.6E-05	
Pyrene	129-00-0	N	mg/l	<7e-005 JL	<7e-005	<7e-005	<7e-005 JL	0.00064 J	
Total PAHs		TPAH	N	mg/l	ND	ND	ND	ND	0.00064 J
Total Petroleum Hydrocarbons									
nC6 to nC12	TPH-1005-1	N	mg/l	--	--	--	--	--	< 0.20
>nC12 to nC28	TPH-1005-2	N	mg/l	--	--	--	--	--	< 0.20
>nC28 to nC35	TPH-1005-4	N	mg/l	--	--	--	--	--	< 0.20
Total Petroleum Hydrocarbons	TPH	N	mg/l	--	--	--	--	--	< 0.20

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Sediment Analytical Data Summary - East Ditch South Brine Service Company Superfund Site

Analyte	Sample Location	EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDSSD03A	EDSSD03B	EDSSD03C	EDSSD03D	EDSSD03E	EDSSD01	EDSSD02	EDSSD05	EDSSD07	EDSSD08	
	Depth Interval	0-0.5 ft	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017									
	Sample Date	CAS No.	Units																		
METALS																					
Aluminum	7429-90-5	mg/kg	14200	9940	8530	5810	9130	4870	11200	8750	9920	4940	7060	11000	8800	5070	18200	12000	18800	21900	20400
Antimony	7440-36-0	mg/kg	<0.42	<0.38	<0.32	<0.28	<0.32	<0.32	<0.36	<0.33	<0.35	<0.243	<0.26	0.369 J	<0.32	<0.266	<0.245	<0.232	<0.304	<0.307	<0.260
Arsenic	7440-38-2	mg/kg	3.35	2.49	3.18	2.28	2.42	2.26	2.94	2.54	2.87	3.12	2.86	2.86	3.93	3.52	4.01	3.61	6.45	6.81	3.65
Barium	7440-39-3	mg/kg	978	594	567	484	1250	264	395	586	674	1460	1840	2690	646	383	626	382	1180	1350	343
Beryllium	7440-41-7	mg/kg	0.56 J	0.48 J	0.331 J	0.248 J	0.332 J	0.219 J	0.614 J	0.477 J	0.568 J	0.293 J	0.364 J	0.621 J	0.499 J	0.294 J	0.736	0.494	0.852	0.952	0.86
Cadmium	7440-43-9	mg/kg	0.352 J	0.266 J	0.192 J	0.355 J	0.333 J	0.0966 J	0.312 J	0.327 J	0.394 J	0.211 J	0.374 J	0.332	0.28 J	0.411	0.288	0.553	0.649	0.694	
Chromium	7440-47-3	mg/kg	9.05	6.85	4.46	4.8	5.61	3.14	6.78	5.69	9.41	5.9	6.65	11.9	10.8	5.1	14.4	10.7	18.7	20.6	17.6
Cobalt	7440-48-4	mg/kg	6.52 J	3.65 J	6.82	3.21	3.96	2.89	4.55	5.12	3.9	4.46	4.52	5.51	3.2	1.97	5.43	3.84	5.97	6.68	6.2
Copper	7440-50-8	mg/kg	11.9	9.11	5.25	5.26	7.49	3.28	7.8	6.37	12.5	7.18	10.5	21.5	20.6	10.1	15.4	15.7	27.4	32.9	17
Lead	7439-92-1	mg/kg	33	22.8	14.1	12.6	18	6.41	11.2	14	77	20.4	35.4	76.3	42.1	26.2	41.7	20.4	46.4	58.5	27.2
Manganese	7439-96-5	mg/kg	514 J	253 J	559	262	314	252	253	379	280	155	468	166	175	115	233	162	270	336	237
Nickel	7440-02-0	mg/kg	8.46	6.06	5.03	4.26	5.69	2.98	6.93	5.44	6.47	5.36	5.85	8.53	7.03	3.71	10.1	7.32	13.1	13.9	11.5
Selenium	7782-49-2	mg/kg	0.757 J	0.512 J	0.371 J	0.399 J	0.501 J	<0.32	0.59 J	0.571 J	0.641 J	0.29 J	<0.234	0.324 J	0.35 J	0.289 J	0.466	<0.209	0.609	0.935	0.535
Silver	7440-22-4	mg/kg	<0.067	<0.061	<0.051	<0.045	<0.052	<0.051	0.13 J	0.161 J	0.13 J	<0.0973	<0.104	0.213 J	0.186 J	<0.106	<0.0981	<0.093	<0.121	<0.123	<0.104
Thallium	7440-28-0	mg/kg	0.268 J	0.139 J	0.0952 J	<0.079	<0.091	<0.089	0.217 J	0.234 J	0.288 J	0.14 J	0.108 J	0.203 J	0.126 J	<0.093	0.227	0.144	0.233	0.266	0.25
Vanadium	7440-62-2	mg/kg	17.7	13.1	15.7	9.79	13.4	10.2	14.3	13.8	14.2	12.4	12.8	19.8	14.3	9.51	26	17.2	29.9	31.9	31.3
Zinc	7440-66-6	mg/kg	60.1	45.6	22.4	48	48.3	15.6	33.9	32.8	78.9	35.2	55.6	124	545	55.9	92.5	63.3	178	179	111
Mercury	7439-97-6	mg/kg	0.0246	0.0213	0.00735	0.0219	0.0225	0.0056	0.0143	0.0128	0.0184	0.134	0.023	0.057	0.25	0.0272	0.171	0.017	0.0487	0.04	0.032
Cyanide	57-12-5	mg/kg	<1	<0.93	<0.79	<0.75	<0.84	<0.79	<0.94	<0.88	0.99 J	---	---	---	---	---	---	---	---	---	---
PESTICIDES AND PCBs																					
4,4'-DDD	72-54-8	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
4,4'-DDE	72-55-9	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
4,4'-DDT	50-29-3	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	0.024 JH	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
Aldrin	309-00-2	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
alpha-BHC	319-84-6	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
alpha-Chlordane	5103-71-9	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
beta-BHC	319-85-7	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	0.04 JH	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
delta-BHC	319-86-8	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
Dieldrin	60-57-1	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
Endosulfan I	959-98-8	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
Endosulfan II	33213-65-9	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endosulfan sulfate	1031-07-8	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endrin	72-20-8	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endrin aldehyde	7421-93-4	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
gamma-BHC	58-89-9	mg/kg	<0.0017	<0.016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
gamma-Chlordane	5103-74-2	mg/kg	<0.0017	<0.016	<0.0013	<0.0013	0.028	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
Heptachlor	76-44-8	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.002											

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-det

--- Not Analyzed

Sediment Analytical Data Summary - East Ditch South
Brine Service Company Superfund Site

Analyte	Sample Location		EDSSD01 0-0.5 ft		EDSSD01 0-0.5 ft		EDSSD02 0-0.5 ft		EDSSD03 0-0.5 ft		EDSSD04 0-0.5 ft		EDSSD05 0-0.5 ft		EDSSD06 0-0.5 ft		EDSSD07 0-0.5 ft		EDSSD08 0-0.5 ft		EDSSD03A 0-0.5 ft		EDSSD03B 0-0.5 ft		EDSSD03C 0-0.5 ft		EDSSD03D 0-0.5 ft		EDSSD03E 0-0.5 ft		EDSSD01 0-0.5 ft		EDSSD02 0-0.5 ft		EDSSD05 0-0.5 ft		EDSSD07 0-0.5 ft		EDSSD08 0-0.5 ft	
	CAS No.	Units	11/18/2010	mg/kg	11/18/2010	mg/kg	3/22/2017	mg/kg	3/22/2017	mg/kg	3/22/2017	mg/kg	3/22/2017	mg/kg	10/25/2017	mg/kg	10/25/2017	mg/kg	10/25/2017	mg/kg	10/25/2017	mg/kg																		
Carbon tetrachloride	56-23-5	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00054	<0.00044	<0.00088	<0.00072	<0.00059	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>			
Chlorobenzene	108-90-7	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00054	<0.00044	<0.00088	<0.00072	<0.00059	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>			
Chloroethane	75-00-3	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.00072	<0.00058	<0.0012	<0.00096	<0.00078	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Chloroform	67-66-3	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Chloromethane	74-87-3	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
cis > 1,2-Dichloroethene	156-59-2	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00058	<0.0012	<0.00096	<0.00078	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Cyclohexane	110-82-7	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.0009	0.066	<0.0015	<0.0012	<0.00098	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Dibromochloromethane	124-48-1	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00058	<0.0012	<0.00096	<0.00078	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>				
Ethylbenzene	100-41-4	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	0.036 J	<0.00066	<0.00079	<0.00074	0.038 J	<0.00063	0.043	<0.001	<0.00084	0.033 J	<0.00078	<0.00078	<0.0012	<0.00011	<0.00075	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>
Isopropylbenzene	98-82-8	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00063	<0.00051	<0.001	<0.00084	<0.00068	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>			
Methyl acetate	79-20-9	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00063	<0.00051	<0.001	<0.00084	<0.00068	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---	&---			
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Methylcyclohexane	108-87-2	mg/kg																																						

Sediment Analytical Data Summary - East Ditch South
Brine Service Company Superfund Site

Analyte	Sample Location		EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDSSD03A	EDSSD03B	EDSSD03C	EDSSD03D	EDSSD03E	EDSSD01	EDSSD02	EDSSD05	EDSSD07	EDSSD08
	Depth Interval	Sample Date	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
	CAS No.	Units																			
Dibenzofuran	132-64-9	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	<0.0018	< 0.0019	< 0.0023	0.0069 J	< 0.002	< 0.0009	< 0.00086	< 0.0011	< 0.0011	< 0.00098
Diethyl phthalate	84-66-2	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	< 0.0026	< 0.0027	< 0.0033	< 0.0029	---	---	---	---	---	---
Dimethyl phthalate	131-11-3	mg/kg	<0.0041 JL	<0.0038 JL	<0.016 JL	<0.003 JL	<0.0034	<0.0032 JL	<0.0038 JL	<0.0036 JL	<0.0037 JL	< 0.0021	< 0.0021	< 0.0026	< 0.0027	< 0.0023	---	---	---	---	---
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0043 JL	<0.0039 JL	<0.017 JL	<0.0032 JL	<0.0035	<0.0033 JL	<0.004 JL	<0.0037 JL	<0.0039 JL	< 0.0031	< 0.0032	< 0.004	0.012 J	< 0.0035	---	---	---	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	<0.005 JL	<0.0045 JL	<0.019 JL	<0.0037 JL	<0.0041	<0.0038 JL	<0.0046 JL	<0.0043 JL	<0.0045 JL	< 0.0023	< 0.0024	< 0.003	< 0.0026	---	---	---	---	---	---
Fluoranthene	206-44-0	mg/kg	0.056 JL	0.031 JL	<0.015 JL	0.026	0.0048 JL	0.036 JL	0.013 JL	0.038 JL	0.035	0.081	0.073	0.37	0.046	0.011	0.0059	0.011	0.007	0.0099	
Fluorene	86-73-7	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	< 0.0029	< 0.0029	< 0.0036	0.0055 J	< 0.0032	< 0.0014	< 0.0018	< 0.0018	< 0.0015	
Hexachlorobenzene	118-74-1	mg/kg	<0.0045 JL	<0.0041 JL	<0.017 JL	<0.0033 JL	<0.0037	<0.0034 JL	<0.0041 JL	<0.0039 JL	< 0.004 JL	< 0.0023	< 0.0024	< 0.003	< 0.003	< 0.0026	---	---	---	---	
Hexachlorobutadiene	87-68-3	mg/kg	<0.0076 JL	<0.0069 JL	<0.029 JL	<0.0056 JL	<0.0062	<0.0058 JL	<0.007 JL	<0.0065 JL	<0.0068 JL	< 0.0031	< 0.0032	< 0.004	< 0.004	< 0.0035	---	---	---	---	---
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0062 JL	<0.0056 JL	<0.024 JL	<0.0045 JL	<0.0051	<0.0048 JL	<0.0057 JL	<0.0053 JL	<0.0056 JL	< 0.0021	< 0.0021	< 0.0026	< 0.0027	< 0.0023	---	---	---	---	---
Hexachloroethane	67-72-1	mg/kg	<0.0067 JL	<0.0061 JL	<0.026 JL	<0.0049 JL	<0.0055	<0.0051 JL	<0.0062 JL	<0.0058 JL	<0.006 JL	< 0.0039	< 0.004	< 0.005	< 0.0043	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.099 JL	<0.0055 JL	<0.023 JL	0.094 JL	0.013	<0.0046 JL	0.011 JL	0.0055 JL	0.018 JL	< 0.0021	0.049	0.056	0.096	0.023	0.0043	0.004	0.0044	0.0021	0.0043
Isophorone	78-59-1	mg/kg	<0.0052 JL	<0.0047 JL	<0.02 JL	<0.0038 JL	<0.0042	<0.004 JL	<0.0047 JL	<0.0044 JL	<0.0046 JL	< 0.0021	< 0.0021	< 0.0026	< 0.0027	< 0.0023	---	---	---	---	---
Naphthalene	91-20-3	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	0.0067 J	0.0071 J	0.0083 J	0.012	0.01	< 0.00077	< 0.00074	< 0.00096	< 0.00097	< 0.00084
Nitrobenzene	98-95-3	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	< 0.0023	< 0.0024	< 0.003	< 0.003	< 0.0026	---	---	---	---	---
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0069 JL	<0.0063 JL	<0.027 JL	<0.0051 JL	<0.0056	<0.0053 JL	<0.0063 JL	<0.0059 JL	<0.0062 JL	< 0.0029	< 0.0029	< 0.0036	< 0.0037	< 0.0032	---	---	---	---	---
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	< 0.0018	< 0.0019	< 0.0023	< 0.0023	< 0.002	---	---	---	---	---
Pentachlorophenol	87-86-5	mg/kg	<0.0048 JL	<0.0044 JL	<0.019 JL	<0.0035 JL	<0.0037 JL	<0.0044 JL	<0.0041 JL	<0.0043 JL	<0.0086	< 0.0088	< 0.011	< 0.011	< 0.0095	---	---	---	---	---	
Phenanthrene	85-01-8	mg/kg	0.013 JL	0.014 JL	<0.02 JL	0.009 JL	0.015	<0.004 JL	0.013 JL	0.0053 JL	0.018 JL	0.017	0.041	0.041	0.16	0.032	0.0066	0.0033	0.0056	0.0034	0.0042
Phenol	108-95-2	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	< 0.0029	< 0.0029	< 0.0036	< 0.0037	< 0.0032	---	---	---	---	---
Pyrene	129-00-0	mg/kg	0.064 JL	0.026 JL	<0.015 JL	0.016 JL	0.026	0.0037 JL	0.027 JL	0.01 JL	0.036 JL	0.046	0.067	0.08	0.33	0.063	0.0096	0.0052	0.010	0.0069	0.0093
Low Molecular Weight PAHs	LPAH	mg/kg	0.0386	0.037	All ND	0.0299	0.0359	0.0236	0.0365	0.0274	0.0409	0.0459	0.0809	0.0948	0.2365	0.0779	---	---	---	---	---
High Molecular Weight PAHs	HPAH	mg/kg	0.2862	0.1124	All ND	0.0729	0.116	0.0219	0.1105	0.0469	0.1421	0.241	0.506	0.51	1.636	0.346	---	---	---	---	---
Total PAHs	TPAH	mg/kg	0.4977	0.2085	All ND	0.1541	0.2361	0.0657	0.2032	0.1021	0.2756	0.302	0.587	0.61	1.87	0.424	0.0672	0.0419	0		

Soil Analytical Data Summary - East Ditch Riparian Soil Brine Services Company Superfund Site

Sample Location			ESSB10 0-0.5 ft 1/4/2012	ESSB11 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS02 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB11 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units								
METALS										
Aluminum#	7429-90-5	mg/kg	7280	4090	4890	6540	7800	6720	9070	9390
Antimony	7440-36-0	mg/kg	<0.2	<0.19	<0.25	<0.3	<0.21	<0.22	<0.2	<0.22
Arsenic	7440-38-2	mg/kg	2.85	1.87	2.35	2.61	2.54	2.75	3.45	2.83
Barium#	7440-39-3	mg/kg	203	206	156	467	224	1310	1140	161
Beryllium	7440-41-7	mg/kg	0.522	0.303 J	0.272 J	0.406 J	0.563	0.453 J	0.624	0.679
Cadmium#	7440-43-9	mg/kg	0.192 J	0.117 J	0.126 J	0.214 J	0.147 J	0.311 J	0.456 J	0.166 J
Chromium#	7440-47-3	mg/kg	5.01	3.47	3.03	4.23	5.86	5.83	7.35	6.01
Cobalt	7440-48-4	mg/kg	3.98	2.28	2.24	2.94	3.48	3.26	4.61	4.63
Copper#	7440-50-8	mg/kg	6.01	4.19	2.91	5.53	6.04	13.7	12.1	5.92
Lead#	7439-92-1	mg/kg	10.4	7.93	5.14	10.5	9.33	84.8	43.5	8.73
Manganese#	7439-96-5	mg/kg	220	116	121	180	120	156	256	297
Nickel#	7440-02-0	mg/kg	5.51	3.31	3.15	4.76	5.31	5.55	6.95	6.54
Selenium#	7782-49-2	mg/kg	1.09	0.53 U	<0.25	<0.3	1.19	0.998	1.43	1.32
Silver	7440-22-4	mg/kg	<0.081	<0.076	<0.041	<0.048	<0.083	<0.086	<0.081	<0.087
Thallium	7440-28-0	mg/kg	0.105 U	0.0739 U	0.174 J	0.15 J	0.188 U	0.158 U	0.136 U	0.161 U
Vanadium	7440-62-2	mg/kg	13.4	6.99	9.89	10.9	9.62	11.7	11.1	13.8
Zinc#	7440-66-6	mg/kg	23.9	18.8	12.8	25.9	18.3	72.9	64.5	18.1
Mercury#	7439-97-6	mg/kg	0.0115	0.011	0.00602	0.0133	0.0124	0.0174	0.0185	0.0244
Cyanide#	57-12-5	mg/kg	<0.7	2.64	<0.65	<0.76	4.55	1.03 J	0.722 J	1.2 J
PESTICIDES and PCBs										
4,4'-DDD	72-54-8	mg/kg	<0.00058	<0.00054	<0.00056	<0.00064	<0.00058	<0.00057	<0.00056	<0.0006
4,4'-DDE	72-55-9	mg/kg	<0.00058	<0.00054	<0.00056	<0.00064	<0.00058	<0.00057	<0.00056	<0.0006
4,4'-DDT#	50-29-3	mg/kg	<0.00058	<0.00054	<0.00056	0.029 J	<0.00058	<0.00057	<0.00056	<0.0006
Aldrin	309-00-2	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
alpha-BHC	319-84-6	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
alpha-Chlordane	5103-71-9	mg/kg	<0.00023	<0.00021	<0.00022	<0.00025	<0.00023	<0.00023	<0.00022	<0.00024
beta-BHC	319-85-7	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
delta-BHC	319-86-8	mg/kg	<0.00023	<0.00021	<0.00022	<0.00025	<0.00023	<0.00023	<0.00022	<0.00024
Dieldrin	60-57-1	mg/kg	<0.00058	<0.00054	<0.00056	<0.00064	<0.00058	<0.00057	<0.00056	<0.0006
Endosulfan I	959-98-8	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
Endosulfan II	33213-65-9	mg/kg	<0.0007	<0.00064	<0.00067	<0.00076	<0.00069	<0.00069	<0.00067	<0.00072
Endosulfan sulfate	1031-07-8	mg/kg	<0.0007	<0.00064	<0.00067	<0.00076	<0.00069	<0.00069	<0.00067	<0.00072
Endrin	72-20-8	mg/kg	<0.0007	<0.00064	<0.00067	<0.00076	<0.00069	<0.00069	<0.00067	<0.00072
Endrin aldehyde	7421-93-4	mg/kg	<0.0007	<0.00064	<0.00067	<0.00076	<0.00069	<0.00069	<0.00067	<0.00072
gamma-BHC	58-89-9	mg/kg	<0.00023	<0.00021	<0.00022	<0.00025	<0.00023	<0.00023	<0.00022	<0.00024
gamma-Chlordane	5103-74-2	mg/kg	<0.00023	<0.00021	<0.00022	<0.00025	<0.00023	<0.00023	<0.00022	<0.00024
Heptachlor	76-44-8	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
Heptachlor epoxide	1024-57-3	mg/kg	<0.00035	<0.00032	<0.00033	<0.00038	<0.00035	<0.00034	<0.00033	<0.00036
Methoxychlor	72-43-5	mg/kg	<0.0039	<0.0036	<0.0038	<0.0043	<0.0039	<0.0039	<0.0038	<0.0041
Toxaphene	8001-35-2	mg/kg	<0.0056	<0.0051	<0.0042	<0.0048	<0.0055	<0.0055	<0.0053	<0.0058
Aroclor 1016	12674-11-2	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1221	11104-28-2	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1232	11141-16-5	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1242	53469-21-9	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1248	12672-29-6	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1254	11097-69-1	mg/kg	<0.0028	<0.0026	<0.0027	<0.0031	<0.0028	<0.0027	<0.0027	<0.0029
Aroclor 1260	11096-82-5	mg/kg	<0.0021	<0.0019	<0.002	<0.0023	<0.0021	<0.0021	<0.002	<0.0022
Total PCBs	TPCB	mg/kg	<0.00945	<0.00875	<0.0091	<0.01045	<0.00945	<0.00915	<0.0091	<0.0098
VOLATILE ORGANIC COMPOUNDS										
1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	<0.00069	<0.00071	<0.0005	<0.00063	<0.00077	<0.00066	<0.00074	<0.00062
1,1,1-Trichloroethane	71-55-6	mg/kg	<0.0017	<0.0017	<0.0005	<0.00063	<0.0019	<0.0016	<0.0018	<0.0015
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	mg/kg	<0.0013	<0.0013	<0.0005	<0.00063	<0.0014	<0.0012	<0.0014	<0.0011
1,1,2-Trichloroethane	79-00-5	mg/kg	<0.002	<0.002	<0.0005	<0.00063	<0.0022	<0.0019	<0.0021	<0.0018
1,1-Dichloroethane	75-34-3	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
1,1-Dichloroethene	75-35-4	mg/kg	<0.0015	<0.0015	<0.0005	<0.00063	<0.0017	<0.0014	<0.0016	<0.0013
1,2,4-Trichlorobenzene	120-82-1	mg/kg	<0.00089	<0.00091	<0.0006	<0.00075	<0.00099	<0.00085	<0.00095	<0.00079
1,2,4-Trimethylbenzene	95-63-6	mg/kg	<0.00079	<0.00081	<0.0005	<0.00063	<0.00088	<0.00075	<0.00084	<0.0007
1,2-Dibromoethane	106-93-4	mg/kg	<0.00069	<0.00071	<0.0005	<0.00063	<0.00077	<0.00066	<0.00074	<0.00062
1,2-Dichlorobenzene	95-50-1	mg/kg	<0.00079	<0.00081	<0.0005	<0.00063	<0.00088	<0.00075	<0.00084	<0.0007
1,2-Dichloroethane	107-06-2	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
1,2-Dichloropropane	78-87-5	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
1,3,5-Trimethylbenzene	108-67-8	mg/kg	<0.00079	<0.00081	<0.0005	<0.00063	<0.00088	<0.00075	<0.00084	<0.0007
1,3-Dichlorobenzene	541-73-1	mg/kg	<0.00089	<0.00091	<0.0005	<0.00063	<0.00099	<0.00085	<0.00095	<0.00079

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - East Ditch Riparian Soil
Brine Services Company Superfund Site

Sample Location			ESSB10 0-0.5 ft 1/4/2012	ESSB11 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS02 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB11 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units								
1,4-Dichlorobenzene	106-46-7	mg/kg	<0.00069	<0.00071	<0.0005	<0.00063	<0.00077	<0.00066	<0.00074	<0.00062
2-Butanone	78-93-3	mg/kg	<0.0022	<0.0022	<0.0014	<0.0018	<0.0024	<0.0021	<0.0023	<0.0019
2-Hexanone	591-78-6	mg/kg	<0.0017	<0.0017	<0.00099	<0.0013	<0.0019	<0.0016	<0.0018	<0.0015
4-Methyl-2-pentanone	108-10-1	mg/kg	<0.00099	<0.001	<0.00099	<0.0013	<0.0011	<0.00094	<0.0011	<0.00088
Acetone	67-64-1	mg/kg	<0.0045	<0.0046	<0.002	<0.0025	<0.0051	<0.0043	<0.0048	<0.0041
Benzene	71-43-2	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
Bromodichloromethane	75-27-4	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
Bromoform	75-25-2	mg/kg	<0.00069	<0.00071	<0.0005	<0.00063	<0.00077	<0.00066	<0.00074	<0.00062
Bromomethane	74-83-9	mg/kg	<0.00099	<0.001	<0.00099	<0.0013	<0.0011	<0.00094	<0.0011	<0.00088
Carbon disulfide	75-15-0	mg/kg	<0.0016	<0.0016	<0.00099	<0.0013	<0.0018	<0.0015	<0.0017	<0.0014
Carbon tetrachloride	56-23-5	mg/kg	<0.0012	<0.0012	<0.0005	<0.00063	<0.0013	<0.0011	<0.0013	<0.0011
Chlorobenzene	108-90-7	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
Chloroethane	75-00-3	mg/kg	<0.00099	<0.001	<0.00099	<0.0013	<0.0011	<0.00094	<0.0011	<0.00088
Chloroform	67-66-3	mg/kg	<0.0018	<0.0018	<0.0005	<0.00063	<0.002	<0.0017	<0.0019	<0.0016
Chloromethane	74-87-3	mg/kg	<0.00089	<0.00091	<0.00099	<0.0013	<0.00099	<0.00085	<0.00095	<0.00079
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.0015	<0.0015	<0.0005	<0.00063	<0.0017	<0.0014	<0.0016	<0.0013
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
Cyclohexane	110-82-7	mg/kg	<0.0012	<0.0012	<0.0005	<0.00063	<0.0013	<0.0011	<0.0013	<0.0011
Dibromochloromethane	124-48-1	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
Dichlorodifluoromethane	75-71-8	mg/kg	<0.0018	<0.0018	<0.0005	<0.00063	<0.002	<0.0017	<0.0019	<0.0016
Ethylbenzene	100-41-4	mg/kg	<0.00089	<0.00091	<0.0005	<0.00063	<0.00099	<0.00085	<0.00095	<0.00079
Isopropylbenzene	98-82-8	mg/kg	<0.00099	<0.001	<0.0005	<0.00063	<0.0011	<0.00094	<0.0011	<0.00088
Methyl acetate	79-20-9	mg/kg	<0.00099	<0.001	<0.0005	<0.00063	<0.0011	<0.00094	<0.0011	<0.00088
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.0019	<0.0019	<0.0005	<0.00063	<0.0021	<0.0018	<0.002	<0.0017
Methylcyclohexane	108-87-2	mg/kg	<0.0015	<0.0015	<0.0005	<0.00063	<0.0017	<0.0014	<0.0016	<0.0013
Methylene chloride	75-09-2	mg/kg	<0.0025	0.0034 J	0.0022 U	0.002 U	0.0034 J	<0.0024	0.0049 J	0.0036 JH
Naphthalene	91-20-3	mg/kg	<0.00079	<0.00081	<0.0005	0.00065 U	<0.00088	<0.00075	<0.00084	<0.0007
n-Butylbenzene	104-51-8	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
n-Propylbenzene	103-65-1	mg/kg	<0.00089	<0.00091	<0.0005	<0.00063	<0.00099	<0.00085	<0.00095	<0.00079
sec-Butylbenzene	135-98-8	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
Styrene	100-42-5	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
tert-Butylbenzene	98-06-6	mg/kg	<0.00059	<0.00061	<0.0005	<0.00063	<0.00066	<0.00057	<0.00063	<0.00053
Tetrachloroethene	127-18-4	mg/kg	<0.00099	<0.001	<0.0006	<0.00075	<0.0011	<0.00094	<0.0011	<0.00088
Toluene	108-88-3	mg/kg	<0.00069	<0.00071	<0.0005	<0.00063	<0.00077	<0.00066	<0.00074	<0.00062
trans-1,2-Dichloroethene	156-60-5	mg/kg	<0.00089	<0.00091	<0.0005	<0.00063	<0.00099	<0.00085	<0.00095	<0.00079
trans-1,3-Dichloropropene	10061-02-6	mg/kg	<0.00049	<0.00051	<0.0005	<0.00063	<0.00055	<0.00047	<0.00053	<0.00044
Trichloroethene	79-01-6	mg/kg	<0.0016	<0.0016	<0.0005	<0.00063	<0.0018	<0.0015	<0.0017	<0.0014
Trichlorofluoromethane	75-69-4	mg/kg	<0.00079	<0.00081	<0.0005	<0.00063	<0.00088	<0.00075	<0.00084	<0.0007
Vinyl chloride	75-01-4	mg/kg	<0.00099	<0.001	<0.0005	<0.00063	<0.0011	<0.00094	<0.0011	<0.00088
Xylenes, Total	1330-20-7	mg/kg	<0.0026	<0.0026	<0.0015	<0.0019	<0.0029	<0.0025	<0.0027	<0.0023
SEMICVOLATILE ORGANIC COMPOUNDS										
1,1'-Biphenyl	92-52-4	mg/kg	<0.0019	<0.0017	<0.0032	<0.0037	<0.0019	<0.0018	<0.0018	<0.0019
1-Methylnaphthalene	90-12-0	mg/kg	<0.0019	<0.0017	<0.0026	<0.0029	0.0021 J	0.0031 J	0.002 J	<0.0019
2,4,5-Trichlorophenol	95-95-4	mg/kg	<0.0019	<0.0017	<0.0031	<0.0036	<0.0019	<0.0018	<0.0018	<0.0019
2,4,6-Trichlorophenol	88-06-2	mg/kg	<0.0019	<0.0017	<0.0037	<0.0042	<0.0019	<0.0018	<0.0018	<0.0019
2,4-Dichlorophenol	120-83-2	mg/kg	<0.0019	<0.0017	<0.0024	<0.0028	<0.0019	<0.0018	<0.0018	<0.0019
2,4-Dimethylphenol	105-67-9	mg/kg	<0.0019	<0.0017	<0.0037 JL	<0.0042 JL	<0.0019	<0.0018	<0.0018	<0.0019
2,4-Dinitrophenol	51-28-5	mg/kg	<0.0038	<0.0036	<0.0037 JL	<0.0042 JL	<0.0038	<0.0038	<0.0037	<0.004
2,4-Dinitrotoluene	121-14-2	mg/kg	<0.							

Soil Analytical Data Summary - East Ditch Riparian Soil
Brine Services Company Superfund Site

Sample Location			ESSB10 0-0.5 ft 1/4/2012	ESSB11 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS02 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB11 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units								
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	<0.0019	<0.0017	<0.0024	<0.0028	<0.0019	<0.0018	<0.0018	<0.0019
4-Nitroaniline	100-01-6	mg/kg	<0.0019	<0.0017	<0.0037	<0.0042	<0.0019	<0.0018	<0.0018	<0.0019
4-Nitrophenol	100-02-7	mg/kg	<0.0038	<0.0036	<0.0042	<0.0048	<0.0038	<0.0038	<0.0037	<0.004
Acenaphthene	83-32-9	mg/kg	0.0021 J	<0.0017	<0.0024	<0.0028	<0.0019	<0.0018	<0.0018	<0.0019
Acenaphthylene	208-96-8	mg/kg	<0.0019	<0.0017	<0.0024	<0.0028	<0.0019	<0.0018	<0.0018	<0.0019
Acetophenone	98-86-2	mg/kg	<0.0019	<0.0017	<0.0027	<0.0031	0.0051 U	0.0024 U	0.01 U	<0.0019
Anthracene	120-12-7	mg/kg	0.0044 J	0.0024 J	<0.0024	<0.0028	0.0024 J	0.0047 J	<0.0018	<0.0019
Benz(a)anthracene	56-55-3	mg/kg	0.014	0.014	<0.0031	0.01	0.0099	0.025	0.0065 J	0.0029 J
Benzaldehyde	100-52-7	mg/kg	<0.0019	0.0076	<0.0051 JL	<0.0059 JL	0.0047 J	<0.0018 JL	0.01	0.0061 J
Benzo(a)pyrene	50-32-8	mg/kg	0.012	0.016	<0.0026	0.011	0.0091	0.027	0.0067 J	0.0026 J
Benzo(b)fluoranthene	205-99-2	mg/kg	0.018	0.017	<0.0037	0.015	0.014	0.032	0.0079	0.0033 J
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.011	0.013	<0.0032	0.0096	0.021	0.024	0.0069 J	0.0029 J
Benzo(k)fluoranthene	207-08-9	mg/kg	0.0081	0.009	<0.0037	0.0058 J	0.0072 J	0.014	0.0037 J	<0.0019
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.0019	<0.0017	<0.0027	<0.0031	<0.0019	<0.0018	<0.0018	<0.0019
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.0019	<0.0017	<0.0031	<0.0036	<0.0019	<0.0018	<0.0018	<0.0019
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.0019	<0.0017	<0.003	<0.0034	<0.0019	<0.0018	<0.0018	<0.0019
Bis(2-ethylhexyl)pthalate	117-81-7	mg/kg	0.0051 U	0.0088 U	<0.0073	0.011 U	0.011	0.012	0.0051 U	0.015
Butyl benzyl phthalate	85-68-7	mg/kg	<0.0032	0.0047 J	<0.0028	<0.0032	0.0054 J	<0.0032	<0.0031	<0.0034
Caprolactam	105-60-2	mg/kg	<0.0023	<0.0022	<0.0027	<0.0031	<0.0023	<0.0023	<0.0022	0.0047 J
Carbazole	86-74-8	mg/kg	0.003 J	0.0022 J	<0.0024	<0.0028	0.0024 J	0.0036 J	<0.0018	<0.0019
Chrysene	218-01-9	mg/kg	0.014	0.014	<0.0032	0.011	0.0088	0.027	0.0073 J	0.0027 U
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.0038 J	0.0036 J	<0.0024	<0.0028	0.0042 J	<0.0023	0.0039 J	<0.0024
Dibenzofuran	132-64-9	mg/kg	<0.0019	<0.0017	<0.0024	<0.0028	<0.0019	<0.0018	<0.0018	<0.0019
Diethyl phthalate	84-66-2	mg/kg	<0.0019	<0.0017	<0.0037	<0.0042	0.0021 U	<0.0018	<0.0018	<0.0019
Dimethyl phthalate	131-11-3	mg/kg	<0.0023	<0.0022	<0.0027	<0.0031	<0.0023	<0.0023	<0.0022	<0.0024
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0023	0.004 U	<0.0028	<0.0032	0.0065 J	0.0047 U	0.004 U	0.0043 U
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0023	<0.0022	<0.0032	<0.0037	<0.0023	0.0023 U	<0.0022	<0.0024
Fluoranthene	206-44-0	mg/kg	0.02	0.024	0.0031 J	0.02	0.015	0.036	0.0079	0.0048 J
Fluorene	86-73-7	mg/kg	<0.0019	<0.0017	<0.0024	<0.0028	<0.0019	0.0024 J	<0.0018	<0.0019
Hexachlorobenzene	118-74-1	mg/kg	<0.0019	<0.0017	<0.0029	<0.0033	<0.0019	<0.0018	<0.0018	<0.0019
Hexachlorobutadiene	87-68-3	mg/kg	<0.0019	<0.0017	<0.0049	<0.0056	<0.0019	<0.0018	<0.0018	<0.0019
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0019	<0.0017	<0.004	<0.0046	<0.0019	<0.0018 JL	<0.0018	<0.0019
Hexachloroethane	67-72-1	mg/kg	<0.0019	<0.0017	<0.0043	<0.005	<0.0019	<0.0018	<0.0018	<0.0019
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.0095	0.013	<0.0039	0.0094	0.0081	0.022	0.0061 J	0.0027 J
Isophorone	78-59-1	mg/kg	<0.0019	<0.0017	<0.0033	<0.0038	<0.0019	<0.0018	<0.0018	<0.0019
Naphthalene	91-20-3	mg/kg	<0.0019	0.0023 J	<0.0037	<0.0042	0.0043 J	0.0029 J	0.0037 J	<0.0019
Nitrobenzene	98-95-3	mg/kg	<0.0019	<0.0017	<0.0037	<0.0042	<0.0019	<0.0018	<0.0018	<0.0019
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0023	<0.0022	<0.0044	<0.0051	<0.0023	<0.0023	<0.0022	<0.0024
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0023	<0.0022	<0.0024	<0.0028	<0.0023	<0.0023	<0.0022	<0.0024
Pentachlorophenol	87-86-5	mg/kg	<0.0021	<0.0019	<0.0031	<0.0036	<0.0021	<0.0021	<0.002	<0.0022
Phenanthrene	85-01-8	mg/kg	0.014	0.012	<0.0033	0.0087	0.008	0.021	0.0052 J	0.0033 U
Phenol	108-95-2	mg/kg	<0.0023	<0.0022	<0.0037	<0.0042	<0.0023	<0.0023	<0.0022	<0.0024
Pyrene	129-00-0	mg/kg	0.017	0.022	<0.0024	0.016	0.014	0.036	0.0084	0.0031 U
Low Molecular Weight PAHs	LPAH	mg/kg	0.0243	0.023	0.0196	0.0275	0.0217	0.0389	0.0191	0.009
High Molecular Weight PAHs	HPAH	mg/kg	0.0808	0.0936	0.0168	0.0708	0.061	0.1522	0.0407	0.0173
Total PAHs	TPAH	mg/kg	0.1527	0.1694	0.0535	0.141	0.1351	0.2862	0.0864	0.0371

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - East Ditch South Sediments Tenne Service Company Superfund Site

Analyte	Sample Location	EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDSSD03A	EDSSD03B	EDSSD03C	EDSSD03D	EDSSD03E	EDSSD01	EDSSD02	EDSSD05	EDSSD07	EDSSD08	
	Depth Interval	0-0.5 ft	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-0.5 ft									
	Sample Date	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	
METALS																					
Aluminum	7429-90-5	mg/kg	14200	9940	8530	5810	9130	4870	11200	8750	9920	4940	7060	11000	8800	5070	18200	12000	18800	21900	20400
Antimony	7440-36-0	mg/kg	<0.42	<0.38	<0.32	<0.28	<0.32	<0.32	<0.36	<0.33	<0.35	<0.243	<0.26	0.369 J	<0.32	<0.266	<0.245	<0.232	<0.304	<0.307	<0.260
Arsenic	7440-38-2	mg/kg	3.35	2.49	3.18	2.28	2.42	2.26	2.94	2.54	2.87	3.12	2.86	3.93	3.52	4.01	3.61	6.45	6.81	3.65	
Barium	7440-39-3	mg/kg	978	594	567	484	1250	264	395	586	674	1460	1840	2690	646	383	626	382	1180	1350	343
Beryllium	7440-41-7	mg/kg	0.56 J	0.48 J	0.331 J	0.248 J	0.332 J	0.219 J	0.614 J	0.477 J	0.568 J	0.293 J	0.364 J	0.621 J	0.499 J	0.294 J	0.736	0.494	0.852	0.952	0.86
Cadmium	7440-43-9	mg/kg	0.352 J	0.266 J	0.192 J	0.355 J	0.333 J	0.0966 J	0.312 J	0.327 J	0.394 J	0.211 J	0.374 J	0.626 J	3.32	0.28 J	0.411	0.288	0.553	0.649	0.694
Chromium	7440-47-3	mg/kg	9.05	6.85	4.46	4.8	5.61	3.14	6.78	5.69	9.41	5.9	6.65	11.9	10.8	5.1	14.4	10.7	18.7	20.6	17.6
Cobalt	7440-48-4	mg/kg	6.52 J	3.65 J	6.82	3.21	3.96	2.89	4.55	5.12	3.9	4.46	4.52	5.51	3.2	1.97	5.43	3.84	5.97	6.68	6.2
Copper	7440-50-8	mg/kg	11.9	9.11	5.25	5.26	7.49	3.28	7.8	6.37	12.5	7.18	10.5	21.5	20.6	10.1	15.4	15.7	27.4	32.9	17
Lead	7439-92-1	mg/kg	33	22.8	14.1	12.6	18	6.41	11.2	14	77	20.4	35.4	76.3	42.1	26.2	41.7	20.4	46.4	58.5	27.2
Manganese	7439-96-5	mg/kg	514 J	253 J	559	262	314	252	253	379	280	155	468	166	175	115	233	162	270	336	237
Nickel	7440-02-0	mg/kg	8.46	6.06	5.03	4.26	5.69	2.98	6.93	5.44	6.47	5.36	5.85	8.53	7.03	3.71	10.1	7.32	13.1	13.9	11.5
Selenium	7782-49-2	mg/kg	0.757 J	0.512 J	0.371 J	0.399 J	0.501 J	<0.32	0.59 J	0.571 J	0.641 J	0.29 J	<0.234	0.324 J	0.35 J	0.289 J	0.466	<0.209	0.609	0.935	0.535
Silver	7440-22-4	mg/kg	<0.067	<0.061	<0.051	<0.045	<0.052	<0.051	0.13 J	0.161 J	0.13 J	<0.0973	<0.104	0.213 J	0.186 J	<0.106	<0.0981	<0.093	<0.121	<0.123	<0.104
Thallium	7440-28-0	mg/kg	0.268 J	0.139 J	0.0952 J	<0.079	<0.091	<0.089	0.217 J	0.234 J	0.288 J	0.14 J	0.108 J	0.203 J	0.126 J	<0.093	0.227	0.144	0.233	0.266	0.25
Vanadium	7440-62-2	mg/kg	17.7	13.1	15.7	9.79	13.4	10.2	14.3	13.8	14.2	12.4	12.8	19.8	14.3	9.51	26	17.2	29.9	31.9	31.3
Zinc	7440-66-6	mg/kg	60.1	45.6	22.4	48	48.3	15.6	33.9	32.8	78.9	35.2	55.6	124	545	55.9	92.5	63.3	178	179	111
Mercury	7439-97-6	mg/kg	0.0246	0.0213	0.00735	0.0219	0.0225	0.0056	0.0143	0.0128	0.0184	0.134	0.023	0.057	0.25	0.0272	0.171	0.017	0.0487	0.04	0.032
Cyanide	57-12-5	mg/kg	<1	<0.93	<0.79	<0.75	<0.84	<0.79	<0.94	<0.88	0.99 J	---	---	---	---	---	---	---	---	---	
PESTICIDES AND PCBs																					
4,4'-DDD	72-54-8	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
4,4'-DDE	72-55-9	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
4,4'-DDT	50-29-3	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	0.024 JH	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
Aldrin	309-00-2	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
alpha-BHC	319-84-6	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
alpha-Chlordane	5103-71-9	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
beta-BHC	319-85-7	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	0.04 JH	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
delta-BHC	319-86-8	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
Dieldrin	60-57-1	mg/kg	<0.0043	<0.0039	<0.0034	<0.0032	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---	---	---	---	---	---	---	
Endosulfan I	959-98-8	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---	---	---	---	---	---	---	
Endosulfan II	33213-65-9	mg/kg	<0.0052	<0.0047	<0.0034	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endosulfan sulfate	1031-07-8	mg/kg	<0.0052	<0.0047	<0.0038	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endrin	72-20-8	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
Endrin aldehyde	7421-93-4	mg/kg	<0.0052	<0.0047	<0.004	<0.0038	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---	---	---	---	---	---	---	
gamma-BHC	58-89-9	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
gamma-Chlordane	5103-74-2	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	0.028	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---	---	---	---	---	---	---	
Heptachlor	76-44-8	mg/kg	<0.0026	<0.0024	<0.002	<0.0019	<0.0021	<0.002	<0.0024	<0.0022	<0.0023</td										

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-de

--- Not Analyzed

Soil Analytical Data Summary -
East Ditch South Sediments
Brine Service Company Superfund Site

Analyte	Sample Location		Depth Interval																Sample Date																			
	Depth Interval		EDSSD01 0-0.5 ft		EDSSD01 0-0.5 ft		EDSSD02 0-0.5 ft		EDSSD03 0-0.5 ft		EDSSD04 0-0.5 ft		EDSSD05 0-0.5 ft		EDSSD06 0-0.5 ft		EDSSD07 0-0.5 ft		EDSSD08 0-0.5 ft		EDSSD03A 0-6 in		EDSSD03B 0-6 in		EDSSD03C 0-6 in		EDSSD03D 0-6 in		EDSSD03E 0-6 in		EDSSD01 0-6 in		EDSSD02 0-6 in		EDSSD05 0-6 in		EDSSD07 0-6 in	
	CAS No.	Units	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017						
Carbon tetrachloride	56-23-5	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00054	<0.00044	<0.00088	<0.00072	<0.00059	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Chlorobenzene	108-90-7	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00054	<0.00044	<0.00088	<0.00072	<0.00059	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Chloroethane	75-00-3	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	<0.00045	<0.00045	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Chloroform	67-66-3	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00045	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Chloromethane	74-87-3	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.00045	<0.00045	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00058	<0.00012	<0.00096	<0.00078	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Cyclohexane	110-82-7	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00045	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Dibromochloromethane	124-48-1	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00063	<0.00051	<0.001	<0.00084	<0.00068	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Ethylbenzene	100-41-4	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	0.036 J	<0.00066	<0.00079	<0.00074	0.038 J	<0.00063	0.043	<0.001	<0.00084	0.033 J	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.00075					
Isopropylbenzene	98-82-8	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00081	0.016	<0.0013	<0.0011	<0.00088	<0.00078	<0.00078	<0.00012	<0.00011	---	---	---	---	---	---	---	---	---	---	---	---						
Methyl acetate	79-20-9	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00063	<0.00051	<0.001	<0.00084	<0.00068	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00045	<0.00036	<0.00073	<0.0006	<0.00049	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Methylcyclohexane	108-87-2	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	<0.00063	<0.00051	<0.001	<0.00098	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
Methylene chloride	75-09-2	mg/kg	<0.0017	<0.0016	<0.0013	<0.0013	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	<0.0009	<0.00073	<0.0015	<0.0012	<0.00098	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
Naphthalene	91-20-3	mg/kg	<0.00086	<0.00078	<0.00067	<0.00064	<0.00071	<0.00066	<0.00079	<0.00074																												

Soil Analytical Data Summary -
East Ditch South Sediments
Brine Service Company Superfund Site

Analyte	Sample Location		EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDSSD03A	EDSSD03B	EDSSD03C	EDSSD03D	EDSSD03E	EDSSD01	EDSSD02	EDSSD05	EDSSD07	EDSSD08
	Depth Interval	Sample Date	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-6 in	0-0.5 ft
	CAS No.	Units	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	3/22/2017	3/22/2017	3/22/2017	3/22/2017	3/22/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017	10/25/2017
Dibenzofuran	132-64-9	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	<0.0018	<0.0019	<0.0023	0.0069 J	<0.002	<0.0009	<0.00086	<0.0011	<0.0011	<0.00098
Diethyl phthalate	84-66-2	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	<0.0026	<0.0027	<0.0033	<0.0029	---	---	---	---	---	---
Dimethyl phthalate	131-11-3	mg/kg	<0.0041 JL	<0.0038 JL	<0.016 JL	<0.003 JL	<0.0034	<0.0032 JL	<0.0038 JL	<0.0036 JL	<0.0037 JL	<0.0021	<0.0021	<0.0026	<0.0027	<0.0023	---	---	---	---	---
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0043 JL	<0.0039 JL	<0.017 JL	<0.0032 JL	<0.0035	<0.0033 JL	<0.004 JL	<0.0037 JL	<0.0039 JL	<0.0031	<0.0032	<0.004	0.012 J	<0.0035	---	---	---	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	<0.005 JL	<0.0045 JL	<0.019 JL	<0.0037 JL	<0.0041	<0.0038 JL	<0.0046 JL	<0.0043 JL	<0.0045 JL	<0.0023	<0.0024	<0.003	<0.0026	---	---	---	---	---	---
Fluoranthene	206-44-0	mg/kg	0.056 JL	0.031 JL	<0.015 JL	0.014 JL	0.026	0.0048 JL	0.036 JL	0.013 JL	0.038 JL	0.035	0.081	0.073	0.37	0.046	0.011	0.0059	0.011	0.007	0.0099
Fluorene	86-73-7	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	<0.0029	<0.0029	<0.0036	0.0055 J	<0.0032	<0.0014	<0.0014	<0.0018	<0.0018	<0.0015
Hexachlorobenzene	118-74-1	mg/kg	<0.0045 JL	<0.0041 JL	<0.017 JL	<0.0033 JL	<0.0037	<0.0034 JL	<0.0041 JL	<0.0039 JL	<0.004 JL	<0.0023	<0.0024	<0.003	<0.003	<0.0026	---	---	---	---	---
Hexachlorobutadiene	87-68-3	mg/kg	<0.0076 JL	<0.0069 JL	<0.029 JL	<0.0056 JL	<0.0062	<0.0058 JL	<0.007 JL	<0.0065 JL	<0.0068 JL	<0.0031	<0.0032	<0.004	<0.004	<0.0035	---	---	---	---	---
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0062 JL	<0.0056 JL	<0.024 JL	<0.0045 JL	<0.0051	<0.0048 JL	<0.0057 JL	<0.0053 JL	<0.0056 JL	<0.0021	<0.0021	<0.0026	<0.0027	<0.0023	---	---	---	---	---
Hexachloroethane	67-72-1	mg/kg	<0.0067 JL	<0.0061 JL	<0.026 JL	<0.0049 JL	<0.0055	<0.0051 JL	<0.0062 JL	<0.0058 JL	<0.006 JL	<0.0039	<0.004	<0.005	<0.0043	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.099 JL	<0.0055 JL	<0.023 JL	0.094 JL	0.013	<0.0046 JL	0.011 JL	0.0055 JL	0.018 JL	<0.0021	0.049	0.056	0.096	0.023	0.0043	0.004	0.0044	0.0021	0.0043
Isophorone	78-59-1	mg/kg	<0.0052 JL	<0.0047 JL	<0.02 JL	<0.0038 JL	<0.0042	<0.004 JL	<0.0047 JL	<0.0044 JL	<0.0046 JL	<0.0021	<0.0021	<0.0026	<0.0027	<0.0023	---	---	---	---	---
Naphthalene	91-20-3	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	0.0067 J	0.0071 J	0.0083 J	0.012	0.01	<0.00077	<0.00074	<0.00096	<0.00097	<0.00084
Nitrobenzene	98-95-3	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	<0.0023	<0.0024	<0.003	<0.003	<0.0026	---	---	---	---	---
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0069 JL	<0.0063 JL	<0.027 JL	<0.0051 JL	<0.0056	<0.0053 JL	<0.0063 JL	<0.0059 JL	<0.0062 JL	<0.0029	<0.0029	<0.0036	<0.0037	<0.0032	---	---	---	---	---
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0038 JL	<0.0034 JL	<0.015 JL	<0.0028 JL	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	<0.0018	<0.0019	<0.0023	<0.0023	<0.002	---	---	---	---	---
Pentachlorophenol	87-86-5	mg/kg	<0.0048 JL	<0.0044 JL	<0.019 JL	<0.0035 JL	<0.004 JL	<0.0037 JL	<0.0041 JL	<0.0044 JL	<0.0048	<0.0086	<0.0088	<0.011	<0.011	<0.0095	---	---	---	---	---
Phenanthrene	85-01-8	mg/kg	0.013 JL	0.014 JL	<0.02 JL	0.009 JL	0.015	<0.004 JL	0.013 JL	0.0053 JL	0.018 JL	0.017	0.041	0.16	0.032	0.0066	0.0033	0.0056	0.0034	0.0042	
Phenol	108-95-2	mg/kg	<0.0057 JL	<0.0052 JL	<0.022 JL	<0.0042 JL	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	<0.0029	<0.0029	<0.0036	<0.0037	<0.0032	---	---	---	---	---
Pyrene	129-00-0	mg/kg	0.064 JL	0.026 JL	<0.015 JL	0.016 JL	0.026	0.0037 JL	0.027 JL	0.01 JL	0.036 JL	0.046	0.067	0.08	0.33	0.063	0.0096	0.0052	0.010	0.0069	0.0093
Low Molecular Weight PAHs	LPAH	mg/kg	0.0386	0.037	All ND	0.0299	0.0359	0.0236	0.0365	0.0274	0.0409	0.0459	0.0809	0.0948	0.2365	0.0779	---	---	---	---	---
High Molecular Weight PAHs	HPAH	mg/kg	0.2862	0.1124	All ND	0.0729	0.116	0.0219	0.1105	0.0469	0.1421	0.241	0.5								

Surface Water Data Summary
North Portion (Marine) East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	T/D	Units	Sample Location		EDSW04	EDSW05	EDSW06	EDSW07	EDSW08	EDSW09	EDSW10	EDSW11	EDSW12	EDSW04	EDSW05	EDSW06	EDSW10	EDSW10-DUP		
				Sample Date		11/17/2010	11/17/2010	11/17/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	10/24/2017	10/24/2017	10/24/2017	10/24/2017
METALS																					
Aluminum#	7429-90-5	T	mg/l	2.11	0.165	0.253 JL	0.157	0.306	0.095	0.0911	0.283	0.0617	0.0405	0.0263	0.0404	0.029	0.0355				
Aluminum#	7429-90-5	D	mg/l	0.178	0.0363	0.0622	0.0243	0.023	0.0233	0.0242	0.074	0.0102	---	---	---	---	---	---			
Antimony	7440-36-0	T	mg/l	0.000789 J	0.00083 J	0.000826 J	<0.0005	<0.0005	<0.0025	<0.0005	<0.0008	<0.0008	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004			
Arsenic	7440-38-2	D	mg/l	0.0104	0.00878	0.00922	0.00872	0.0105	0.0156 J	0.00977	0.00881	0.0148	0.00628	0.0103	0.00672	0.0082	0.00947				
Barium	7440-39-3	T	mg/l	0.639	0.159	0.214	0.279	0.278	0.19	0.219	0.193	0.0966	0.552	0.246	0.369	0.176	0.162				
Beryllium	7440-41-7	T	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0015	0.000317 J	<0.0007	<0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			
Cadmium	7440-43-9	D	mg/l	<0.003	<0.003	<0.003	<0.0012	<0.0012	<0.003	<0.0012	<0.0008	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			
Chromium	7440-47-3	D	mg/l	<0.003	<0.003	<0.003	<0.0006	<0.0006	0.000641 J	<0.0006	<0.0012	<0.0012	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004			
Cobalt	7440-48-4	T	mg/l	0.00243 J	0.00623	0.00239 J	<0.0005	<0.0005	0.00353 J	<0.0005	0.00101 J	0.00662	0.000596	0.00308	0.000434	0.000407	0.000392				
Copper	7440-50-8	D	mg/l	<0.0025	<0.0025	<0.0025	0.000873 J	0.000609 J	0.000566 J	0.000704 J	0.00344 J	<0.0015	0.00112	<0.001	0.00103	<0.001	<0.001	<0.001			
Lead	7439-92-1	D	mg/l	0.00238 J	<0.002	<0.002	<0.0008	<0.0008	<0.002	<0.0008	0.000871 J	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006				
Manganese#	7439-96-5	T	mg/l	0.909	1.03	0.742	0.308	0.352	1.95	0.536	0.677	2.7	0.197	0.503	0.211	0.58	0.544				
Nickel	7440-02-0	D	mg/l	<0.007	0.00775 J	<0.007	0.00319 J	0.00296 J	0.0039 J	0.00299 J	0.00778	0.0122	0.00127	0.00367	0.00138	0.00124	0.00138				
Selenium	7782-49-2	T	mg/l	<0.0025	0.00391 J	0.00476 J	<0.0025	0.00294 J	<0.012	0.0028 J	0.00156 J	0.00121 J	<0.0011	0.0018	0.00148	<0.0011	<0.0011				
Silver	7440-22-4	D	mg/l	<0.0035	<0.0035	<0.0035	<0.0007	<0.0007	<0.0007	<0.0007	<0.0008	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				
Thallium	7440-28-0	T	mg/l	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.0008	<0.001	<0.002	<0.0002	<0.0002	<0.0002	<0.0002				
Vanadium	7440-62-2	T	mg/l	0.00735	0.00498 J	0.00637	0.00322 J	0.0022 J	<0.0035	0.00164 J	0.00265 J	<0.0009	0.00434	0.00605	0.00353	0.000956	0.0041				
Zinc	7440-66-6	D	mg/l	<0.012	0.0542	0.0455	0.00829	0.00456 J	0.0081	0.0113	0.0225	0.0104	0.00488	0.133	0.0056	0.00586	0.011				
Mercury	7439-97-6	T	mg/l	6e-005 J	5.6e-005 J	7.4e-005 J	4.2e-005 J	5.2e-005 J	4.2e-005	4.4e-005 J	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005				
Cyanide	57-12-5	T	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
PESTICIDES AND PCBs																					
4,4'-DDD	72-54-8	N	mg/l	<2.5e-005	<2.5e-005	5.6e-006 JL	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006				
4,4'-DDE	72-55-9	N	mg/l	<2.5e-005	<2.5e-005	1e-005 JL	4.0e-06	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006				
4,4'-DDT#	50-29-3	N	mg/l	<2.5e-005	4.8e-005 J	1.6e-005 JL	9.30E-06	2.8e-006 J	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006				
Aldrin	309-00-2	N	mg/l	<1.2e-005	2.90E-05	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006				
alpha-BHC	319-84-6	N	mg/l	<1.2e-005	<1.2e-005	<1.2e-005	<1.2e-005	<1.2e-005	<1.2e-005	3.80E-06	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006	<1.2e-006				
alpha-Chlordane	5103-71-9	N	mg/l	<2.5e-005	<2.5e-005	5.5e-006 JL	<2.5e-006	<2.5e-006</td													

Surface Water Data Summary
North Portion (Marine) East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Sample Location	Sample Date	EDSW04	EDSW05	EDSW06	EDSW07	EDSW08	EDSW09	EDSW10	EDSW11	EDSW12	EDSW04	EDSW05	EDSW06	EDSW10	EDSW10-DUP	
				11/17/2010	11/17/2010	11/17/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	1/31/2012	1/31/2012	10/24/2017	10/24/2017	10/24/2017	10/24/2017
SEMICOLVATILE ORGANIC COMPOUNDS																		
Ethylbenzene	100-41-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	---	---	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	
Isopropylbenzene	98-82-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Methyl acetate	79-20-9	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Methyl tert-butyl ether	1634-04-4	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Methylcyclohexane	108-87-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	---	---	---	---	---	---	---	
Methylene chloride	75-09-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	---	---	---	---	---	---	---	
Naphthalene	91-20-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
n-Propylbenzene	103-65-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
sec-Butylbenzene	135-98-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Styrene	100-42-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Tetrachloroethene	127-18-4	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	---	---	---	---	---	---	---	
Toluene	108-88-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	
trans-1,2-Dichloroethene	156-60-5	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	---	---	---	---	---	---	---	
trans-1,3-Dichloropropene	10061-02-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---	---	---	---	---	---	---	
Trichloroethene	79-01-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00035 J	<0.0001	---	---	---	---	---	---	---	
Trichlorofluoromethane	75-69-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	---	---	---	---	---	---	---	
Vinyl chloride	75-01-4	N	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	---	---	---	---	---	---	---	
Xylenes, Total	1330-20-7	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	---	---	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	
SEMICOLVATILE ORGANIC COMPOUNDS																		
1,1'-Biphenyl	92-52-4	N	mg/l	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
1-Methylnaphthalene	90-12-0	N	mg/l	<9e-05 JL	<9e-05 JL	<9e-05 JL	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<0.000223	< 0.000223	< 0.000232	< 0.000216
2,4,5-Trichlorophenol	95-95-4	N	mg/l	<9e-05 JL	<9e-05 JL	<9e-05 JL	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05
2,4,6-Trichlorophenol	88-06-2	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05
2,4-Dichlorophenol	120-83-2	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05
2,4-Dimethylphenol	105-67-9	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05
2,4-Dinitrophenol	51-28-5	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05
2,4-Dinitrotoluene	121-14-2	N	mg/l	<9e-05 JL	<9e-05 JL	<9e-05 JL	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05	<9e-05
2,6-Dinitrophenol	606-20-2	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05
2-Chloronaphthalene	91-58-7	N	mg/l	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
2-Chlorophenol	95-57-8	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05	<8e-05
2-Methylnaphthalene	91-57-6	N	mg/l	<7e-05 JL	<7e-05 JL	<7e-05 JL	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05	<7e-05
2-Methylphenol	95-48-7	N	mg/l	<8e-05 JL	<8e-05 JL	<8e-05 JL	<8e-05	<8e-05	<8e-05	<8e-05	&							

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location	EDDSD01	EDDSD02	EDDSD03	EDDSD04	EDDSD05	EDDSD06	EDDSD07	EDDSD08	EDDSD09	EDDSD10	EDDSD07	EDDSD09	EDNSS01	EDNSD02	EDNSD03	EDNSD03			
	Depth Interval	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	1/31/2012	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft			
	CAS No.	Units																		
METALS																				
Aluminum	7429-90-5	mg/kg	8240	8730	9700	6060	6360	7670	5340	4360	8910	6370	6110	3170	5020	4440	6800	6370	5720	
Antimony	7440-36-0	mg/kg	<0.42	<0.43	<0.39	<0.35	<0.44	<0.5	<0.34	<0.3	<0.36	<0.33	<0.35	<0.36	<0.39	<0.24	<0.38	<0.37	<0.39	
Arsenic	7440-38-2	mg/kg	3.68	37.8	3.36	4.99	5.32	5.98	10.2	3.78	14.4	12.4	6.32	21.2	12.2	2.48	4.56	3.24	3.45	
Barium	7440-39-3	mg/kg	3940	4730	1070	1440	2960	3190	696	278	206	367	395	572	2020	368	484	837	698	
Beryllium	7440-41-7	mg/kg	0.344 J	0.368 J	0.393 J	0.261 J	0.269 J	0.303 J	0.227 J	0.17 J	0.371 J	0.293 J	0.269 J	0.211	0.331	0.3 J	0.541 J	0.411 J	0.374 J	
Cadmium	7440-43-9	mg/kg	1.89	2.42	0.741 J	3.76	1.25	1	1.63	0.33 J	0.307 J	1.27	0.614 J	0.581	2.04	0.4 J	1.23	0.912	0.662 J	
Chromium	7440-47-3	mg/kg	7.58	7.82	6.96	9.36	9.6	10.7	9.19	6.87	5.07	7.23	7.16	12.2	8.73	10.3	7.41	10.4	9.82	
Cobalt	7440-48-4	mg/kg	4.48	3.42	3.62	2.65	2.25	2.61	4.77	2.64	14.5	3.24	3.63	3.35	5	1.97	4.51	3.55	3.51	
Copper	7440-50-8	mg/kg	9.69	10.4	9.62	12	7.66	11.7	13.8	12.4	5.68	28	8.73	15.9	91.5	10.2	19.5	20.8	14.7	
Lead	7439-92-1	mg/kg	37.4	38	31.1	44.4	26.3	25	33.6	14.5	9.68	23.1	24.7	19.4	52.8	225	64.4	133	85.8	
Manganese	7439-96-5	mg/kg	404	319	130	234	230	255	1230	951	441	474	722	1220	2590	148	2530	131	163	
Nickel	7440-02-0	mg/kg	5.83	5.56	5.7	4.16	4.24	4.7	5.06	3.5	8.37	9.75	4.16	4.35	5.67	4.7	5.51	6.24	5.75	
Selenium	7782-49-2	mg/kg	0.955	0.597 J	0.534 J	0.427 J	0.508 J	0.524 J	1.12	<0.3	0.441 J	0.392 J	0.802	0.65	0.968	0.651	1.23	0.9	0.693 J	
Silver	7440-22-4	mg/kg	0.0942 J	0.082 J	0.0639 J	0.0678 J	<0.071	<0.08	0.152 J	<0.048	<0.058	0.128 J	0.258 J	<0.14	<0.16	0.0406 J	0.337 J	0.104 J	0.0792 J	
Thallium	7440-28-0	mg/kg	<0.12	<0.12	<0.11	<0.097	0.167 J	<0.14	<0.096	<0.084	0.297 J	<0.094	0.124 J	<0.13	0.197	0.0892 J	0.21 J	0.103 J	<0.11	
Vanadium	7440-62-2	mg/kg	11.8	12.8	11.8	8.15	12.4	11.1	11.8	9.24	10.7	11	9.79	11.8	13.4	11	12.8	13.7	12.4	
Zinc	7440-66-6	mg/kg	250	192	197	364	171	193	239	55.3	35.2	198	124	119	342	111	408	347	211	
Mercury	7439-97-6	mg/kg	0.178	0.104	0.505	0.259	0.0784	0.133	0.258	0.0835	0.0154	0.105	0.097	0.154	0.144	0.0288	0.212	0.358	0.234	
Cyanide	57-12-5	mg/kg	<1.1	<1.1	<1.1	1.75 J	<1.2	3.03 J	<0.93	<0.78	1.28 J	<0.91	<0.95	---	---	0.673 J	<0.93	<0.94	<0.96	
PESTICIDES AND PCBs																				
4,4'-DDD	72-54-8	mg/kg	<0.0095	<0.0095	<0.0009	<0.0077	<0.01	<0.011	<0.0078	<0.0065	<0.0076	<0.0076	<0.008	<0.0097	<0.01	<0.0053	<0.0078	<0.008	<0.0081	
4,4'-DDE	72-55-9	mg/kg	<0.0095	<0.0095	<0.0009	<0.0077	<0.01	<0.011	<0.0078	<0.0065	<0.0076	<0.0076	<0.008	<0.0097	<0.01	<0.0053	<0.0078	<0.008	<0.0081	
4,4'-DDT	50-29-3	mg/kg	<0.0095	<0.0095	<0.0009	J <0.0009	<0.0077	<0.01	<0.011	<0.0078	<0.0065	<0.0076	<0.0076	<0.008	<0.0097	<0.01	<0.0053	<0.0078	<0.008	<0.0081
Aldrin	309-00-2	mg/kg	<0.0057	<0.0057	<0.00054	<0.0046	<0.006	<0.0068	<0.0047	<0.0039	<0.0046	<0.0046	<0.0048	<0.0058	<0.0063	<0.0032	<0.0047	<0.0048	<0.0049	
alpha-BHC	319-84-6	mg/kg	<0.0057	<0.0057	<0.00054	<0.0046	<0.006	<0.0068	<0.0047	<0.0039	0.027 J	<0.0046	<0.0048	<0.0058	<0.0063	<0.0032	<0.0047	<0.0048	<0.0049	
alpha-Chlordane	5103-71-9	mg/kg	<0.0038	<0.0038	<0.00036	<0.0031	<0.004	<0.0045	<0.0031	<0.0026	<0.003	<0.0031	<0.0032	<0.00						

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval		EDDSD01 0-0.5 ft	EDDSD02 0-0.5 ft	EDDSD03 0-0.5 ft	EDDSD04 0-0.5 ft	EDDSD05 0-0.5 ft	EDDSD06 0-0.5 ft	EDDSD07 0-0.5 ft	EDDSD08 0-0.5 ft	EDDSD09 0-0.5 ft	EDDSD10 0-0.5 ft	EDDSD07 0-0.5 ft	EDDSD09 0-0.5 ft	EDNSS01 0-0.5 ft	EDNSD02 0-0.5 ft	EDNSD03 0-0.5 ft	EDNSD03 0-0.5 ft	
	CAS No.	Units	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	1/31/2012	1/31/2012	11/17/2010	11/17/2010	11/17/2010	11/17/2010		
Acetone	67-64-1	mg/kg	<0.0038	0.015 U	0.014 U	0.0031 U	0.0088 U	0.011 U	0.015 U	<0.0026	0.0055 U	0.011 U	0.023 U	---	---	<0.002	0.012 U	<0.0032	0.015 U
Benzene	71-43-2	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Bromodichloromethane	75-27-4	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Bromoform	75-25-2	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Bromomethane	74-83-9	mg/kg	<0.0019	<0.0019	<0.0018	<0.0015	0.0025 J	0.013 J	0.0035 J	<0.0013	<0.0015	<0.0015	<0.0016	---	---	<0.001	<0.0016	<0.0016	<0.0016
Carbon disulfide	75-15-0	mg/kg	<0.0019	0.0025 J	<0.0018	<0.0015	0.0052 J	0.013 J	0.0035 J	<0.0013	<0.0015	<0.0015	<0.0016	---	---	<0.001	<0.0016	<0.0016	<0.0016
Carbon tetrachloride	56-23-5	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Chlorobenzene	108-90-7	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Chloroethane	75-00-3	mg/kg	<0.0019	<0.0019	<0.0018	<0.0015	<0.00077	<0.002	<0.0023	<0.0016	<0.0013	<0.0015	<0.0016	---	---	<0.001	<0.0016	<0.0016	<0.0016
Chloroform	67-66-3	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Chloromethane	74-87-3	mg/kg	<0.0019	<0.0019	<0.0018	<0.0015	<0.0009	<0.002	<0.0023	<0.0016	<0.0013	<0.0015	<0.0016	---	---	<0.001	<0.0016	<0.0016	<0.0016
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Cyclohexane	110-82-7	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Dibromochloromethane	124-48-1	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Dichlorodifluoromethane	75-71-8	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Ethylbenzene	100-41-4	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Isopropylbenzene	98-82-8	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	0.004 J	<0.0008	<0.00081
Methyl acetate	79-20-9	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Methylcyclohexane	108-87-2	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
Methylene chloride	75-09-2	mg/kg	<0.0019	<0.0019	<0.0018	<0.0015	<0.002	<0.0023	<0.0016	<0.0013	<0.0015	<0.0016	---	---	<0.001	<0.0016	<0.0016	0.017 U	
Naphthalene	91-20-3	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	0.019 J	<0.00079	<0.0008	<0.00081
n-Butylbenzene	104-51-8	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
n-Propylbenzene	103-65-1	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<0.00079	<0.0008	<0.00081
sec-Butylbenzene	135-98-8	mg/kg	<0.0096	<0.0095	<0.0009	<0.00077	<0.001	<0.0011	<0.00078	<0.00066	<0.00076	<0.00077	<0.00081	---	---	<0.00051	<		

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location		EDDSD01 0-0.5 ft	EDDSD02 0-0.5 ft	EDDSD03 0-0.5 ft	EDDSD04 0-0.5 ft	EDDSD05 0-0.5 ft	EDDSD06 0-0.5 ft	EDDSD07 0-0.5 ft	EDDSD08 0-0.5 ft	EDDSD09 0-0.5 ft	EDDSD10 0-0.5 ft	EDDSD07 0-0.5 ft	EDDSD09 0-0.5 ft	EDNSS01 0-0.5 ft	EDNSD02 0-0.5 ft	EDNSD03 0-0.5 ft	EDNSD03 0-0.5 ft	
	Depth Interval	Sample Date	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	1/31/2012	1/31/2012	11/17/2010	11/17/2010	11/17/2010	11/17/2010		
Benzo(b)fluoranthene	205-99-2	mg/kg	<0.063	0.067 J	0.045	0.14 JL	<0.066	<0.075	0.2 JL	1.8	0.052	4.6 JL	0.48	0.38	0.38	<0.035	0.027	0.056 JL	0.057 JL
Benzo(g,h,i)perylene	191-24-2	mg/kg	<0.056	<0.055	0.046	0.094 JL	<0.058	<0.066	0.14 JL	1.3	0.047	3.1 JL	0.35	0.27	0.22	<0.03	0.17	0.049 JL	0.052 JL
Benzo(k)fluoranthene	207-08-9	mg/kg	<0.063	0.066 J	0.059	0.094 JL	<0.066	<0.075	0.14 JL	1.7	0.073	4	0.34	0.17	<0.035	0.036	0.068 JL	0.068 JL	
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.046	<0.046	<0.0043	<0.037 JL	<0.048	<0.054	<0.037 JL	<0.031	<0.0037	<0.037 JL	<0.0039	<0.025	<0.027	<0.025	<0.0038	<0.0038 JL	<0.0039 JL
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.054	<0.053	<0.005	<0.043 JL	<0.056	<0.064	<0.044 JL	<0.037	<0.0043	<0.043 JL	<0.0045	<0.025	<0.027	<0.029	<0.0044	<0.0044 JL	<0.0045 JL
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.052	<0.051	<0.0048	<0.042 JL	<0.054	<0.061	<0.042 JL	<0.035	<0.0041	<0.041 JL	<0.0043	<0.025	<0.027	<0.028	<0.0042	<0.0043 JL	<0.0044 JL
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	<0.13	<0.13	0.098	0.13 JL	<0.13	<0.15	<0.1 JL	<0.087	0.028	<0.1 JL	0.22	1.6	0.17	<0.069	0.026	0.023 JL	0.11 JL
Butyl benzyl phthalate	85-68-7	mg/kg	<0.048	<0.048	0.0063 J	<0.039 JL	<0.05	<0.057	<0.039 JL	<0.033	<0.0038	<0.038 JL	<0.004	<0.044	<0.047	<0.026	<0.0039	<0.004 JL	<0.004 JL
Caprolactam	105-60-2	mg/kg	<0.046	<0.046	<0.0043	<0.037 JL	<0.048	<0.054	<0.037 JL	<0.031	<0.0037	<0.037 JL	<0.0039	<0.031	<0.033	<0.025	<0.0038	<0.0038 JL	<0.0039 JL
Carbazole	86-74-8	mg/kg	<0.042	<0.042	0.0075 J	<0.034 JL	<0.044	<0.05	0.043 JL	0.35	<0.0034	0.77 JL	0.026	0.035	0.034	<0.023	<0.0035	0.011 JL	0.023 JL
Chrysene	218-01-9	mg/kg	<0.056	0.078 J	0.055	0.16 JL	<0.058	<0.066	0.21 JL	2.9	0.077	7.1	0.52	0.31	0.35	0.084	0.05	0.07 JL	0.08 JL
Dibenz(a,h)anthracene	53-70-3	mg/kg	<0.042	<0.042	0.015	<0.034 JL	<0.044	<0.05	<0.034 JL	0.37	<0.0034	1.1 JL	0.13	0.048	0.067	<0.023	<0.0035	<0.0035 JL	<0.0036 JL
Dibenzofuran	132-64-9	mg/kg	<0.042	<0.042	<0.0039	<0.034 JL	<0.044	<0.05	<0.034 JL	0.062 J	<0.0034	0.11 JL	0.0054 J	<0.025	<0.027	<0.023	<0.0035	<0.0035 JL	<0.0036 JL
Diethyl phthalate	84-66-2	mg/kg	<0.063	<0.063	<0.0059	<0.051 JL	<0.066	<0.075	<0.051 JL	<0.043	0.0083 J	<0.051 JL	0.009 J	<0.025	<0.027	<0.035	<0.0052	<0.0052 JL	<0.0053 JL
Dimethyl phthalate	131-11-3	mg/kg	<0.046	<0.046	<0.0043	<0.037 JL	<0.048	<0.054	<0.037 JL	<0.031	<0.0037	<0.037 JL	<0.0039	<0.031	<0.033	<0.025	<0.0038	<0.0038 JL	<0.0039 JL
Di-n-butyl phthalate	84-74-2	mg/kg	<0.048	<0.048	0.0052 J	<0.039 JL	<0.05	<0.057	<0.039 JL	<0.033	<0.0038	<0.038 JL	<0.004	0.097	<0.033	<0.026	<0.0039	<0.004 JL	<0.004 JL
Di-n-octyl phthalate	117-84-0	mg/kg	<0.056	<0.055	0.085	<0.045 JL	<0.058	<0.066	<0.045 JL	<0.038	<0.0044	<0.044 JL	<0.0047	<0.031	<0.033	<0.03	<0.0046	<0.0046 JL	<0.0047 JL
Fluoranthene	206-44-0	mg/kg	0.046 J	0.098 J	0.067	0.18 JL	0.066 J	0.084 J	0.35 JL	6.3	0.12	12	0.96	0.69	0.66	0.054 J	0.027	0.13 JL	0.068 JL
Fluorene	86-73-7	mg/kg	<0.042	<0.042	<0.0039	<0.034 JL	<0.044	<0.05	<0.034 JL	0.17	<0.0034	0.27 JL	0.0097 J	<0.025	<0.027	<0.023	<0.0035	0.0057 JL	<0.0036 JL
Hexachlorobenzene	118-74-1	mg/kg	<0.05	<0.049	<0.0047	<0.04 JL	<0.052	<0.059	<0.041 JL	<0.034	<0.004	<0.04 JL	<0.0042	<0.025	<0.027	<0.0041	<0.0041 JL	<0.0042 JL	
Hexachlorobutadiene	87-68-3	mg/kg	<0.084	<0.084	<0.0079	<0.068 JL	<0.088	<0.1	<0.069 JL	<0.058	<0.0067	<0.067 JL	<0.0071	<0.025	<0.027	<0.046	<0.0069	<0.007 JL	<0.0071 JL
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.069	<0.068	R	<0.056 JL	<0.072	<0.082	<0.056 JL	<0.047	<0.0055	<0.055 JL	<0.0058	<0.025	<0.027	<0.038	<0.0056	<0.0057 JL	<0.0058 JL
Hexachloroethane	67-72-1	mg/kg	<0.075	<0.074	<0.007	<0.06 JL	<0.078	<0.089	<0.061 JL	<0.051	<0.0059	<0.06 JL	<0.0063	<0.025	<0.027	<0.041	<0.0061	<0.0062 JL	<0.0063 JL
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	<0.067	<0.067	0.032	0.086 JL	<0.07	<0.079	0.18 JL	1.4	0.048	3.5 JL	0.39	0.25	0.25	<0.037	<0.0055	0.05 JL	0.038 JL
Isophorone	78-59-1	mg/kg	<0.057	<0.057	<0.0054	<0.046 JL	<0.06	<0.068	<0.047 JL	<0.039	<0.0046	<0.046 JL	<0.0048	<0.025	<0.027	<0.032	<0.0047	<0.0048 JL	<0.0049 JL

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location	Depth Interval	EDNSD04	EDNSD05	EDNSD06	EDNSD07	EDNSD08	EDNSD02	EDNSD05	EDNSD08	EDDSD02	EDDSD05	EDDSD09	EDDSD10
	CAS No.		0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
METALS														
Aluminum	7429-90-5	mg/kg	5050	6480	6820	7530	10000	7730	8050	15100	9060	11800	6970	12500
Antimony	7440-36-0	mg/kg	<0.29	<0.35	<0.34	<0.44	<0.4	<0.249	<0.303	<0.393	0.449	<0.403	<0.282	<0.347
Arsenic	7440-38-2	mg/kg	2.29	2.96	2.7	4.5	4.34	2.58	2.83	4.38	9.12	9.66	8.34	7.13
Barium	7440-39-3	mg/kg	355	456	615	3740	3650	586	644	2780	4280	1730	1250	1320
Beryllium	7440-41-7	mg/kg	0.339 J	0.44 J	0.444 J	0.488 J	0.479 J	0.382	0.444	0.648	0.589	0.634	0.391	0.631
Cadmium	7440-43-9	mg/kg	0.618	0.398 J	0.397 J	0.603 J	1.62	0.591	0.705	0.974	2.89	0.985	17.4	1.16
Chromium	7440-47-3	mg/kg	5.56	5.69	6.23	7.29	9.14	9.64	9.33	14.5	14.4	13.5	10.3	15.4
Cobalt	7440-48-4	mg/kg	3.29	4.05	3.64	3.23	4	2.69	3.23	4.84	4.25	4.68	3.68	6.4
Copper	7440-50-8	mg/kg	7.26	8.4	7.43	10	14.5	10	15.8	18.4	25.1	19.1	20.2	21.1
Lead	7439-92-1	mg/kg	32.9	32	19.6	30.8	57	58.7	48.1	40.3	61.4	45.1	59.1	44.8
Manganese	7439-96-5	mg/kg	199	160	180	291	223	191	166	242	270	252	1270	768
Nickel	7440-02-0	mg/kg	4.54	5.7	5.85	5.9	8.08	5.13	6.37	10.9	8.99	9.51	6.34	11.3
Selenium	7782-49-2	mg/kg	0.779	0.718	0.647 J	1.03	1.39	0.316	0.427	1.13	0.546	1.07	0.542	0.524
Silver	7440-22-4	mg/kg	0.0601 J	<0.056	<0.055	<0.07	0.123 JL	<0.0997	<0.121	<0.157	<0.157	<0.161	0.671	0.155
Thallium	7440-28-0	mg/kg	0.0825 J	0.111 J	0.119 J	0.161 J	0.126 J	0.11	0.115	0.145	0.174	0.159	0.103	0.147
Vanadium	7440-62-2	mg/kg	10.8	11.9	11.6	11.9	14.1	16	15.3	20.2	20.9	19.9	13.7	25.3
Zinc	7440-66-6	mg/kg	105	81.4	126	185	353	112	175	282	340	206	570	227
Mercury	7439-97-6	mg/kg	0.183	0.0642	0.0913	0.4	0.533	0.104	0.142	0.318	0.217	0.383	0.301	0.117
Cyanide	57-12-5	mg/kg	<0.76	<0.9	<0.88	<1.2	<1	---	---	---	---	---	---	---
PESTICIDES AND PCBs														
4,4'-DDD	72-54-8	mg/kg	<0.0032	<0.0038	<0.0037	<0.005	0.012	---	---	---	---	---	---	---
4,4'-DDE	72-55-9	mg/kg	<0.0032	<0.0038	<0.0037	<0.005	<0.00085	---	---	---	---	---	---	---
4,4'-DDT	50-29-3	mg/kg	<0.0032	<0.0038	<0.0037	<0.005	<0.00085 JH	---	---	---	---	---	---	---
Aldrin	309-00-2	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051 J	---	---	---	---	---	---	---
alpha-BHC	319-84-6	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051	---	---	---	---	---	---	---
alpha-Chlordane	5103-71-9	mg/kg	<0.0013	<0.0015	0.011 J	<0.002	<0.00034	---	---	---	---	---	---	---
beta-BHC	319-85-7	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051	---	---	---	---	---	---	---
delta-BHC	319-86-8	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.00034	---	---	---	---	---	---	---
Dieldrin	60-57-1	mg/kg	<0.0032	<0.0038	<0.0037	<0.005	<0.00085	---	---	---	---	---	---	---
Endosulfan I	959-98-8	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051	---	---	---	---	---	---	---
Endosulfan II	33213-65-9	mg/kg	<0.0039	<0.0046	<0.0045	<0.006	<0.001	---	---	---	---	---	---	---
Endosulfan sulfate	1031-07-8	mg/kg	<0.0039	<0.0046	<0.0045	<0.006	<0.001 J	---	---	---	---	---	---	---
Endrin	72-20-8	mg/kg	<0.0039	<0.0046	<0.0045	<0.006	<0.001	---	---	---	---	---	---	---
Endrin aldehyde	7421-93-4	mg/kg	<0.0039	<0.0046	<0.0045	<0.006	<0.001	---	---	---	---	---	---	---
gamma-BHC	58-89-9	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.00034	---	---	---	---	---	---	---
gamma-Chlordane	5103-74-2	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.00034	---	---	---	---	---	---	---
Heptachlor	76-44-8	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051	---	---	---	---	---	---	---
Heptachlor epoxide	1024-57-3	mg/kg	<0.0019	<0.0023	<0.0022	<0.003	<0.00051	---	---	---	---	---	---	---
Methoxychlor	72-43-5	mg/kg	<0.022	<0.026	<0.025	<0.034	<0.0058	---	---	---	---	---	---	---
Toxaphene	8001-35-2	mg/kg	<0.025	<0.029	<0.028	<0.038	<0.0065	---	---	---	---	---	---	---
Aroclor 1016	12674-11-2	mg/kg	<0.0031	<0.0037	<0.0036	<0.0048	<0.0041	---	---	---	---	---	---	---
Aroclor 1221	11104-28-2	mg/kg	<0.0031	<0.0037	<0.0036	<0.0048	<0.0041	---	---	---	---	---	---	---
Aroclor 1232	11141-16-5	mg/kg	<0.0031	<0.0037	<0.0036	<0.0048	<0.0041	---	---	---				

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date	EDNSD04 0-0.5 ft	EDNSD05 0-0.5 ft	EDNSD06 0-0.5 ft	EDNSD07 0-0.5 ft	EDNSD08 0-0.5 ft	EDNSD02 0-0.5 ft	EDNSD05 0-0.5 ft	EDNSD08 0-0.5 ft	EDDSD02 0-0.5 ft	EDDSD05 0-0.5 ft	EDDSD09 0-0.5 ft	EDDSD10 0-0.5 ft
		CAS No.	Units	11/17/2010	11/17/2010	11/17/2010	11/17/2010	10/24/2017	10/24/2017	10/24/2017	10/24/2017	10/24/2017	10/24/2017
Acetone	67-64-1	mg/kg	<0.0026	<0.0031	<0.003	<0.004	<0.0034	---	---	---	---	---	---
Benzene	71-43-2	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	< 0.00043	< 0.00086	< 0.0010	< 0.0013	< 0.0015	< 0.00045
Bromodichloromethane	75-27-4	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Bromoform	75-25-2	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Bromomethane	74-83-9	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.0017	---	---	---	---	---	---
Carbon disulfide	75-15-0	mg/kg	<0.0013	0.0099 J	<0.0015	<0.002	<0.0017	---	---	---	---	---	---
Carbon tetrachloride	56-23-5	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Chlorobenzene	108-90-7	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Chloroethane	75-00-3	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.0017	---	---	---	---	---	---
Chloroform	67-66-3	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Chloromethane	74-87-3	mg/kg	<0.0013	<0.0015	<0.0015	<0.002	<0.0017	---	---	---	---	---	---
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Cyclohexane	110-82-7	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Dibromochloromethane	124-48-1	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Ethylbenzene	100-41-4	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	< 0.00061	< 0.0012	< 0.0014	< 0.0018	< 0.0021	< 0.00063
Isopropylbenzene	98-82-8	mg/kg	<0.00065	<0.00077	<0.00075	0.0052 J	<0.00085	---	---	---	---	---	---
Methyl acetate	79-20-9	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Methylcyclohexane	108-87-2	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Methylene chloride	75-09-2	mg/kg	0.0019 U	<0.0015	<0.0015	<0.002	<0.0017	---	---	---	---	---	---
Naphthalene	91-20-3	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085 JL	---	---	---	---	---	---
n-Butylbenzene	104-51-8	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
n-Propylbenzene	103-65-1	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
sec-Butylbenzene	135-98-8	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Styrene	100-42-5	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
tert-Butylbenzene	98-06-6	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Tetrachloroethene	127-18-4	mg/kg	<0.00078	<0.00092	<0.0009	<0.0012	<0.001	---	---	---	---	---	---
Toluene	108-88-3	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	< 0.00052	< 0.0010	< 0.0012	< 0.0016	< 0.0018	< 0.00054
trans-1,2-Dichloroethene	156-60-5	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
trans-1,3-Dichloropropene	10061-02-6	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Trichloroethene	79-01-6	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Trichlorofluoromethane	75-69-4	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Vinyl chloride	75-01-4	mg/kg	<0.00065	<0.00077	<0.00075	<0.001	<0.00085	---	---	---	---	---	---
Xylenes, Total	1330-20-7	mg/kg	<0.002	<0.0023	<0.0022	<0.003	<0.0026	< 0.00087	< 0.0017	< 0.0020	< 0.0026	< 0.0030	< 0.00090
SVOCs													
1,1'-Biphenyl	92-52-4	mg/kg	<0.0038	<0.0044 JL	<0.0043 JL	<0.0058 JL	<0.0049	---	---	---	---	---	---
1-Methylnaphthalene	90-12-0	mg/kg	<0.003	<0.0035 JL	<0.0034 JL	<0.0046 JL	<0.0039	< 0.0039	< 0.0047	< 0.0062	< 0.0063	< 0.0064	0.071
2,4,5-Trichlorophenol	95-95-4	mg/kg	<0.0036	<0.0043 JL	<0.0042 JL	<0.0056 JL	<0.0048	---	---	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---
2,4-Dichlorophenol	120-83-2	mg/kg	<0.0029	<0.0034 JL	<0.0033 JL	<0.0044 JL	<0.0037	---	---	---	---	---	---
2,4-Dimethylphenol	105-67-9	mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---
2,4-Dinitrophenol	51-28-5	mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---
2,4-Dinitrotoluene	121-14-2	mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---
2,6-Dinitrotoluene	606-20-2	mg/kg	<0.0041	<0.0049 JL	<0.0048 JL	<0.0064 JL	<0.0054	---	---	---	---	---	---
2-Chloronaphthalene	91-58-7	mg/kg	<0.0053	<0.0063 JL	<0.0061 JL	<0.0082 JL	<0.007	---	---	---	---	---	---
2-Chlorophenol	95-57-8	mg/kg	<0.0041	<0.0049 JL	<0.0048 JL	<0.0							

Sediment Analytical Data Summary - East Ditch North
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date	EDNSD04 0-0.5 ft	EDNSD05 0-0.5 ft	EDNSD06 0-0.5 ft	EDNSD07 0-0.5 ft	EDNSD08 0-0.5 ft	EDNSD02 0-0.5 ft	EDNSD05 0-0.5 ft	EDNSD08 0-0.5 ft	EDDSD02 0-0.5 ft	EDDSD05 0-0.5 ft	EDDSD09 0-0.5 ft	EDDSD10 0-0.5 ft
		CAS No.	Units	11/17/2010	11/17/2010	11/17/2010	11/17/2010	10/24/2017	10/24/2017	10/24/2017	10/24/2017	10/24/2017	10/24/2017
Benzo(b)fluoranthene	205-99-2 mg/kg	0.011	0.014 JL	0.014 JL	0.014 JL	0.048	0.0060	0.063	< 0.0050	< 0.0050	< 0.0051	24	0.027
Benzo(g,h,i)perylene	191-24-2 mg/kg	0.016	0.013 JL	0.015 JL	<0.0058 JL	0.023	0.010	0.029	0.0032	< 0.0029	< 0.0030	9.1	0.019
Benzo(k)fluoranthene	207-08-9 mg/kg	0.014	0.019 JL	0.022 JL	0.012 JL	0.016	0.0027	0.020	< 0.0037	< 0.0038	< 0.0039	8.5	0.0073
Bis(2-chloroethoxy)methane	111-91-1 mg/kg	<0.0031	<0.0037 JL	<0.0036 JL	<0.0048 JL	<0.0041	---	---	---	---	---	---	---
Bis(2-chloroethyl)ether	111-44-4 mg/kg	<0.0036	<0.0043 JL	<0.0042 JL	<0.0056 JL	<0.0048	---	---	---	---	---	---	---
Bis(2-chloroisopropyl)ether	108-60-1 mg/kg	<0.0035	<0.0041 JL	<0.004 JL	<0.0054 JL	<0.0046	---	---	---	---	---	---	---
Bis(2-ethylhexyl)phthalate	117-81-7 mg/kg	0.022	0.024 JL	0.083 JL	0.039 JL	0.066	---	---	---	---	---	---	---
Butyl benzyl phthalate	85-68-7 mg/kg	<0.0032	<0.0038 JL	<0.0037 JL	<0.005 JL	0.013	---	---	---	---	---	---	---
Caprolactam	105-60-2 mg/kg	<0.0031	0.027 JL	<0.0036 JL	<0.0048 JL	<0.0041	---	---	---	---	---	---	---
Carbazole	86-74-8 mg/kg	0.0039 J	0.004 JL	0.0033 JL	<0.0044 JL	0.0046 J	---	---	---	---	---	---	---
Chrysene	218-01-9 mg/kg	0.012	0.017 JL	0.023 JL	0.014 JL	0.031	0.0039	0.051	0.0041	0.0042	< 0.0034	24	0.020
Dibenz(a,h)anthracene	53-70-3 mg/kg	<0.0029	<0.0034 JL	<0.0033 JL	<0.0044 JL	0.011 J	< 0.0042	0.012	< 0.0066	< 0.0067	< 0.0069	2.6	< 0.0058
Dibenzofuran	132-64-9 mg/kg	<0.0029	<0.0034 JL	<0.0033 JL	<0.0044 JL	<0.0037	< 0.0018	< 0.0022	< 0.0029	< 0.0029	< 0.0030	0.34	< 0.0025
Diethyl phthalate	84-66-2 mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---	---
Dimethyl phthalate	131-11-3 mg/kg	<0.0031	<0.0037 JL	<0.0036 JL	<0.0048 JL	<0.0041	---	---	---	---	---	---	---
Di-n-butyl phthalate	84-74-2 mg/kg	<0.0032	<0.0038 JL	<0.0037 JL	<0.005 JL	0.0052 J	---	---	---	---	---	---	---
Di-n-octyl phthalate	117-84-0 mg/kg	<0.0038	<0.0044 JL	<0.0043 JL	<0.0058 JL	<0.0049	---	---	---	---	---	---	---
Fluoranthene	206-44-0 mg/kg	0.017	0.023 JL	0.046 JL	0.018 JL	0.041	0.0061	0.091	0.0059	0.0079	0.0048	40	0.028
Fluorene	86-73-7 mg/kg	<0.0029	<0.0034 JL	<0.0033 JL	<0.0044 JL	<0.0037	< 0.0029	< 0.0035	< 0.0046	< 0.0046	< 0.0047	0.74	< 0.0040
Hexachlorobenzene	118-74-1 mg/kg	<0.0034	<0.004 JL	<0.0039 JL	0.0052 JL	<0.0044	---	---	---	---	---	---	---
Hexachlorobutadiene	87-68-3 mg/kg	<0.0057	<0.0068 JL	<0.0066 JL	<0.0088 JL	<0.0075	---	---	---	---	---	---	---
Hexachlorocyclopentadiene	77-47-4 mg/kg	<0.0047	<0.0055 JL	<0.0054 JL	<0.0072 JL	R	---	---	---	---	---	---	---
Hexachloroethane	67-72-1 mg/kg	<0.0051	<0.006 JL	<0.0058 JL	<0.0078 JL	<0.0066 JL	---	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5 mg/kg	0.0088	0.011 JL	0.013 JL	<0.007 JL	0.023	< 0.0021	0.027	< 0.0033	< 0.0033	< 0.0034	9.7	0.011
Isophorone	78-59-1 mg/kg	<0.0039	<0.0046 JL	<0.0045 JL	<0.006 JL	<0.0051	---	---	---	---	---	---	---
Naphthalene	91-20-3 mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	< 0.0016	0.0040	< 0.0025	0.0086	0.024	< 0.018	0.0061
Nitrobenzene	98-95-3 mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---	---
N-Nitrosodi-n-propylamine	621-64-7 mg/kg	<0.0052	<0.0061 JL	<0.006 JL	<0.008 JL	<0.0068	---	---	---	---	---	---	---
N-Nitrosodiphenylamine	86-30-6 mg/kg	<0.0029	<0.0034 JL	<0.0033 JL	<0.0044 JL	<0.0037	---	---	---	---	---	---	---
Pentachlorophenol	87-86-5 mg/kg	<0.0036 JL	<0.0043 JL	<0.0042 JL	<0.0056 JL	<0.0048 JL	---	---	---	---	---	---	---
Phenanthrene	85-01-8 mg/kg	0.0082 J	0.011 JL	0.015 JL	0.01 JL	0.019	< 0.0039	0.039	< 0.0062	< 0.0063	< 0.0064	14	0.012
Phenol	108-95-2 mg/kg	<0.0043	<0.0051 JL	<0.0049 JL	<0.0066 JL	<0.0056	---	---	---	---	---	---	---
Pyrene	129-00-0 mg/kg	0.016	0.024 JL	0.033 JL	0.023 JL	0.039	0.0085	0.080	0.0060	0.0062	0.0041	34	0.027
Low Molecular Weight PAHs	LPAH mg/kg	0.0294	0.0355	0.0389	0.0397	0.0451	---	---	---	---	---	---	---
High Molecular Weight PAHs	HPAH mg/kg	0.0695	0.0954	0.1207	0.0738	0.172	---	---	---	---	---	---	---
Total PAHs	TPAH mg/kg	0.1517	0.1914	0.227	0.1569	0.331	0.0522	0.512	0.0192	0.0269	0.0406	206	0.200

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - South Pit Area
Brine Service Company Superfund Site

Analyte	CAS No.	Units	Sample Location	MWGW02	MWGW02
			Sample Date	2/27/2014	1/18/2017
Metals					
Aluminum, Dissolved	7429-90-5	mg/l	---	---	---
Aluminum, Total	7429-90-5	mg/l	0.14	0.0483	
Antimony, Dissolved	7440-36-0	mg/l	---	---	
Antimony, Total	7440-36-0	mg/l	0.0332	0.00244 J	
Arsenic, Dissolved	7440-38-2	mg/l	---	---	
Arsenic, Total	7440-38-2	mg/l	1.37	0.122	
Barium, Dissolved	7440-39-3	mg/l	---	---	
Barium, Total	7440-39-3	mg/l	0.159	0.381	
Beryllium, Dissolved	7440-41-7	mg/l	---	---	
Beryllium, Total	7440-41-7	mg/l	<0.0035	0.000931 J	
Cadmium, Dissolved	7440-43-9	mg/l	---	---	
Cadmium, Total	7440-43-9	mg/l	<0.004	0.000565 J	
Chromium, Dissolved	7440-47-3	mg/l	---	---	
Chromium, Total	7440-47-3	mg/l	0.404	0.174	
Cobalt, Dissolved	7440-48-4	mg/l	---	---	
Cobalt, Total	7440-48-4	mg/l	0.161	0.00566 J	
Copper, Dissolved	7440-50-8	mg/l	---	---	
Copper, Total	7440-50-8	mg/l	<0.005	0.0403	
Lead, Dissolved	7439-92-1	mg/l	---	---	
Lead, Total	7439-92-1	mg/l	0.0122 J	0.0162	
Manganese, Dissolved	7439-96-5	mg/l	---	---	
Manganese, Total	7439-96-5	mg/l	0.206	0.162	
Nickel, Dissolved	7440-02-0	mg/l	---	---	
Nickel, Total	7440-02-0	mg/l	0.632	0.0828	
Selenium, Dissolved	7782-49-2	mg/l	---	---	
Selenium, Total	7782-49-2	mg/l	0.0101 J	0.00383 J	
Silver, Dissolved	7440-22-4	mg/l	---	---	
Silver, Total	7440-22-4	mg/l	<0.004	<0.0004	
Thallium, Dissolved	7440-28-0	mg/l	---	---	
Thallium, Total	7440-28-0	mg/l	<0.005	<0.0004	
Vanadium, Dissolved	7440-62-2	mg/l	---	---	
Vanadium, Total	7440-62-2	mg/l	1.17	0.0667	
Zinc, Dissolved	7440-66-6	mg/l	---	---	
Zinc, Total	7440-66-6	mg/l	0.326	0.0807	
Mercury, Dissolved	7439-97-6	mg/l	---	---	
Mercury, Total	7439-97-6	mg/l	0.000727	0.000152 J	
Cyanide	57-12-5	mg/l	0.131	---	
Pesticides and PCBs					
4,4'-DDD	72-54-8	mg/l	<0.0012	---	
4,4'-DDE	72-55-9	mg/l	<0.0012	---	
4,4'-DDT	50-29-3	mg/l	<0.0012	---	
Aldrin	309-00-2	mg/l	<0.00062	---	
alpha-BHC	319-84-6	mg/l	0.0075	---	
alpha-Chlordane	5103-71-9	mg/l	<0.0012	---	
beta-BHC	319-85-7	mg/l	<0.00062	---	
delta-BHC	319-86-8	mg/l	<0.00062	---	
Dieldrin	60-57-1	mg/l	0.0049	---	
Endosulfan I	959-98-8	mg/l	<0.00062	---	
Endosulfan II	33213-65-9	mg/l	<0.0012	---	
Endosulfan sulfate	1031-07-8	mg/l	<0.0012	---	
Endrin	72-20-8	mg/l	<0.0012	---	
Endrin aldehyde	7421-93-4	mg/l	<0.0012	---	
gamma-BHC	58-89-9	mg/l	0.0021	---	
gamma-Chlordane	5103-74-2	mg/l	<0.0012	---	
Heptachlor	76-44-8	mg/l	0.0025	---	
Heptachlor epoxide	1024-57-3	mg/l	<0.00062	---	
Methoxychlor	72-43-5	mg/l	<0.0062	---	
Toxaphene	8001-35-2	mg/l	<0.012	---	
Aroclor 1016	12674-11-2	mg/l	<0.01	---	
Aroclor 1221	11104-28-2	mg/l	<0.05	---	

Bold detection above the SDL

< Analyte not detected above SDL

J Concentration estimated; L Low bias, H High bias

U Qualified as non-detect

180330 Appendix B Analytical Data Tables.xlsx: GW South

--- Not Analyzed

NA Not available

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - South Pit Area
Brine Service Company Superfund Site

Analyte	CAS No.	Units	Sample Location	MWGW02	MWGW02
			Sample Date	2/27/2014	1/18/2017
Volatile Organic Compounds					
Aroclor 1232	11141-16-5	mg/l	<0.05	---	---
Aroclor 1242	53469-21-9	mg/l	<0.05	---	---
Aroclor 1248	12672-29-6	mg/l	<0.05	---	---
Aroclor 1254	11097-69-1	mg/l	<0.05	---	---
Aroclor 1260	11096-82-5	mg/l	<0.01	---	---
1,1,1,2-Tetrachloroethane	630-20-6	mg/l	<0.0075	<0.0015	
1,1,1-Trichloroethane	71-55-6	mg/l	<0.005	<0.0010	
1,1,2,2-Tetrachloroethane	79-34-5	mg/l	<0.012	<0.0025	
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	mg/l	<0.025	<0.0050	
1,1,2-Trichloroethane	79-00-5	mg/l	<0.0075	<0.0015	
1,1-Dichloroethane	75-34-3	mg/l	<0.005	<0.0010	
1,1-Dichloroethene	75-35-4	mg/l	<0.005	<0.0010	
1,2,4-Trichlorobenzene	120-82-1	mg/l	<0.012	<0.0025	
1,2,4-Trimethylbenzene	95-63-6	mg/l	0.13	0.17	
1,2-Dibromoethane	106-93-4	mg/l	<0.005	<0.0010	
1,2-Dichlorobenzene	95-50-1	mg/l	<0.012	<0.0025	
1,2-Dichloroethane	107-06-2	mg/l	<0.005	<0.0010	
1,2-Dichloropropane	78-87-5	mg/l	<0.012	<0.0025	
1,3,5-Trimethylbenzene	108-67-8	mg/l	0.039	0.10	
1,3-Dichlorobenzene	541-73-1	mg/l	<0.01	<0.0020	
1,4-Dichlorobenzene	106-46-7	mg/l	<0.01	<0.0020	
2-Butanone	78-93-3	mg/l	0.33	<0.0025	
2-Hexanone	591-78-6	mg/l	<0.025	<0.005	
4-Methyl-2-pentanone	108-10-1	mg/l	0.048 J	<0.0035	
Acetone	67-64-1	mg/l	0.90	<0.010	
Benzene	71-43-2	mg/l	5.8	0.53	
Bromodichloromethane	75-27-4	mg/l	<0.005	<0.0010	
Bromoform	75-25-2	mg/l	<0.01	<0.0020	
Bromomethane	74-83-9	mg/l	<0.01	<0.0020	
Carbon disulfide	75-15-0	mg/l	0.043 J	<0.0030	
Carbon tetrachloride	56-23-5	mg/l	<0.012	<0.0025	
Chlorobenzene	108-90-7	mg/l	<0.0075	<0.0015	
Chloroethane	75-00-3	mg/l	<0.0075	<0.0015	
Chloroform	67-66-3	mg/l	<0.005	<0.0010	
Chloromethane	74-87-3	mg/l	<0.005	<0.0010	
cis-1,2-Dichloroethene	156-59-2	mg/l	<0.005	<0.0010	
cis-1,3-Dichloropropene	10061-01-5	mg/l	<0.0025	<0.00050	
Cyclohexane	110-82-7	mg/l	0.074	0.053	
Dibromochloromethane	124-48-1	mg/l	<0.0075	<0.0015	
Dichlorodifluoromethane	75-71-8	mg/l	<0.0075	<0.0015	
Ethylbenzene	100-41-4	mg/l	0.36	2.0	
Isopropylbenzene	98-82-8	mg/l	0.013 J	0.17	
Methyl acetate	79-20-9	mg/l	<0.025	<0.0050	
Methyl tert-butyl ether	1634-04-4	mg/l	<0.005	<0.0010	
Methylcyclohexane	108-87-2	mg/l	0.044	0.070	
Methylene chloride	75-09-2	mg/l	<0.01	<0.005	
Naphthalene	91-20-3	mg/l	0.11	0.35	
n-Butylbenzene	104-51-8	mg/l	<0.01	<0.0020	
n-Propylbenzene	103-65-1	mg/l	0.011 J	0.032	
sec-Butylbenzene	135-98-8	mg/l	<0.0075	0.012	
Styrene	100-42-5	mg/l	<0.0075	<0.0015	
tert-Butylbenzene	98-06-6	mg/l	<0.0075	<0.0015	
Tetrachloroethene	127-18-4	mg/l	<0.0075	<0.0015	
Toluene	108-88-3	mg/l	1.4	0.089	
trans-1,2-Dichloroethene	156-60-5	mg/l	<0.005	<0.0010	
trans-1,3-Dichloropropene	10061-02-6	mg/l	<0.005	<0.0010	
Trichloroethene	79-01-6	mg/l	<0.005	<0.0010	
Trichlorofluoromethane	75-69-4	mg/l	<0.0075	<0.0015	
Vinyl chloride	75-01-4	mg/l	<0.005	<0.0010	
Xylenes, Total	1330-20-7	mg/l	1.4	2.1	
Semivolatile Organic Compounds					
1,1'-Biphenyl	92-52-4	mg/l	0.012	0.026	
1-Methylnaphthalene	90-12-0	mg/l	0.048	0.15	
2,4,5-Trichlorophenol	95-95-4	mg/l	0.0042	<0.000089	
2,4,6-Trichlorophenol	88-06-2	mg/l	0.0064	<0.000075	
2,4-Dichlorophenol	120-83-2	mg/l	<0.00065	<0.000067	

Bold detection above the SDL

< Analyte not detected above SDL

J Concentration estimated; L Low bias, H High bias

U Qualified as non-detect

180330 Appendix B Analytical Data Tables.xlsx: GW South

--- Not Analyzed

NA Not available

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - South Pit Area
Brine Service Company Superfund Site

Analyte	CAS No.	Units	Sample Location	MWGW02	MWGW02
			Sample Date	2/27/2014	1/18/2017
2,4-Dimethylphenol	105-67-9	mg/l	43	3.6	
2,4-Dinitrophenol	51-28-5	mg/l	<0.0005	<0.00016	
2,4-Dinitrotoluene	121-14-2	mg/l	<0.0003	<0.000091	
2,6-Dinitrotoluene	606-20-2	mg/l	<0.0005	<0.000066	
2-Chloronaphthalene	91-58-7	mg/l	<0.0004	<0.000033	
2-Chlorophenol	95-57-8	mg/l	<0.0004	<0.000056	
2-Methylnaphthalene	91-57-6	mg/l	0.072	0.30	
2-Methylphenol	95-48-7	mg/l	51	3.1	
2-Nitroaniline	88-74-4	mg/l	<0.00038	<0.000064	
2-Nitrophenol	88-75-5	mg/l	<0.00024	<0.000053	
3&4-Methylphenol	106-44-5	mg/l	53	0.089	
3,3'-Dichlorobenzidine	91-94-1	mg/l	<0.00024	<0.000069	
3-Nitroaniline	99-09-2	mg/l	<0.00056	<0.000077	
4,6-Dinitro-2-methylphenol	534-52-1	mg/l	<0.00073	<0.000031	
4-Bromophenyl phenyl ether	101-55-3	mg/l	<0.00047	<0.000080	
4-Chloro-3-methylphenol	59-50-7	mg/l	<0.00022	<0.000050	
4-Chloroaniline	106-47-8	mg/l	<0.00021	<0.000061	
4-Chlorophenyl phenyl ether	7005-72-3	mg/l	<0.00043	<0.000069	
4-Nitroaniline	100-01-6	mg/l	<0.0004	<0.000055	
4-Nitrophenol	100-02-7	mg/l	<0.0006	<0.000073	
Acenaphthene	83-32-9	mg/l	0.015	0.082	
Acenaphthylene	208-96-8	mg/l	<0.00021	<0.000023	
Acetophenone	98-86-2	mg/l	14	<0.000038	
Anthracene	120-12-7	mg/l	0.0017 J	0.018	
Benz(a)anthracene	56-55-3	mg/l	<0.00025	0.0024	
Benzaldehyde	100-52-7	mg/l	<0.00046	<0.000047	
Benz(a)pyrene	50-32-8	mg/l	<0.0003	0.0022	
Benz(b)fluoranthene	205-99-2	mg/l	<0.00028	0.0011	
Benz(g,h,i)perylene	191-24-2	mg/l	<0.00026	0.0012	
Benz(k)fluoranthene	207-08-9	mg/l	<0.00028	0.00023	
Bis(2-chloroethoxy)methane	111-91-1	mg/l	<0.00022	<0.000047	
Bis(2-chloroethyl)ether	111-44-4	mg/l	<0.00029	<0.000041	
Bis(2-chloroisopropyl)ether	108-60-1	mg/l	<0.00064	<0.00011	
Bis(2-ethylhexyl)phthalate	117-81-7	mg/l	0.0011 J	0.0021	
Butyl benzyl phthalate	85-68-7	mg/l	<0.00021	<0.000030	
Caprolactam	105-60-2	mg/l	<0.00059	<0.000070	
Carbazole	86-74-8	mg/l	<0.00025	<0.000039	
Chrysene	218-01-9	mg/l	<0.00046	0.0027	
Dibenz(a,h)anthracene	53-70-3	mg/l	<0.00026	0.00062	
Dibenzofuran	132-64-9	mg/l	<0.00025	0.0082	
Diethyl phthalate	84-66-2	mg/l	<0.00021	<0.000047	
Dimethyl phthalate	131-11-3	mg/l	<0.0003	<0.000064	
Di-n-butyl phthalate	84-74-2	mg/l	<0.0003	<0.000031	
Di-n-octyl phthalate	117-84-0	mg/l	<0.00023	<0.000031	
Fluoranthene	206-44-0	mg/l	<0.0002	0.0016	
Fluorene	86-73-7	mg/l	0.0021	0.012	
Hexachlorobenzene	118-74-1	mg/l	<0.0007	<0.000069	
Hexachlorobutadiene	87-68-3	mg/l	<0.0005	<0.000047	
Hexachlorocyclopentadiene	77-47-4	mg/l	<0.00054	<0.000047	
Hexachloroethane	67-72-1	mg/l	<0.00034	<0.000092	
Indeno(1,2,3-cd)pyrene	193-39-5	mg/l	<0.00051	0.00083	
Isophorone	78-59-1	mg/l	<0.0003	<0.000039	
Naphthalene	91-20-3	mg/l	0.059	0.26	
Nitrobenzene	98-95-3	mg/l	<0.0005	<0.000038	
N-Nitrosodi-n-propylamine	621-64-7	mg/l	<0.0004	<0.000050	
N-Nitrosodiphenylamine	86-30-6	mg/l	<0.00029	<0.000039	
Pentachlorophenol	87-86-5	mg/l	0.086	<0.00012	
Phenanthrene	85-01-8	mg/l	0.013	0.039	
Phenol	108-95-2	mg/l	22	0.015	
Pyrene	129-00-0	mg/l	<0.00022	0.0045	
Total PAHs	TPAH	mg/l	0.20	0.79	
Total Petroleum Hydrocarbons					
nC6 to nC12	TPH-1005-1	mg/l	--	15	
>nC12 to nC28	TPH-1005-2	mg/l	--	8.5	
>nC28 to nC35	TPH-1005-4	mg/l	--	< 0.19	
Total Petroleum Hydrocarbons	TPH	mg/l	--	23.5	

Bold detection above the SDL

< Analyte not detected above SDL

J Concentration estimated; L Low bias, H High bias

U Qualified as non-detect

180330 Appendix B Analytical Data Tables.xlsx: GW South

--- Not Analyzed

NA Not available

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - North Pit Area
Brine Service Company Superfund Site

Sample Location Sample Date Sample ID			MWGW04 2/26/2014 MWGW04-022614	MWGW05 2/26/2014 MWGW05-022614	MWGW15 2/26/2014 MWGW15-022614	MWGW16 2/26/2014 MWGW16-022614
Analyte	CAS No.	Units				
Metals						
Aluminum, Dissolved	7429-90-5	mg/l	<0.008	<0.008	0.016 J	<0.02
Aluminum, Total	7429-90-5	mg/l	<0.008	0.0339	0.0649	0.0388 J
Antimony, Dissolved	7440-36-0	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Antimony, Total	7440-36-0	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Arsenic, Dissolved	7440-38-2	mg/l	0.00348 J	0.0128	0.00949 J	0.0089 J
Arsenic, Total	7440-38-2	mg/l	0.00472 J	0.0181	0.0107	0.00888 J
Barium, Dissolved	7440-39-3	mg/l	0.0494	0.073	0.0522	0.0616
Barium, Total	7440-39-3	mg/l	0.047	0.0732	0.052	0.0624
Beryllium, Dissolved	7440-41-7	mg/l	<0.0014	<0.0014	<0.0014	<0.0035
Beryllium, Total	7440-41-7	mg/l	<0.0014	<0.0014	<0.0014	<0.0035
Cadmium, Dissolved	7440-43-9	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Cadmium, Total	7440-43-9	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Chromium, Dissolved	7440-47-3	mg/l	<0.002	<0.002	<0.002	<0.005
Chromium, Total	7440-47-3	mg/l	<0.002	<0.002	<0.002	<0.005
Cobalt, Dissolved	7440-48-4	mg/l	0.00209 J	<0.0016	0.00896 J	0.04
Cobalt, Total	7440-48-4	mg/l	0.00203 J	<0.0016	0.00902 J	0.0373
Copper, Dissolved	7440-50-8	mg/l	<0.002	<0.002	0.00209 J	<0.005
Copper, Total	7440-50-8	mg/l	<0.002	<0.002	<0.002	<0.005
Lead, Dissolved	7439-92-1	mg/l	<0.0014	<0.0014	<0.0014	<0.0035
Lead, Total	7439-92-1	mg/l	<0.0014	<0.0014	<0.0014	<0.0035
Manganese, Dissolved	7439-96-5	mg/l	0.822	0.555	0.356	2.13
Manganese, Total	7439-96-5	mg/l	0.874	0.619	0.374	2.03
Nickel, Dissolved	7440-02-0	mg/l	0.00311 J	<0.002	0.00283 J	0.0166 J
Nickel, Total	7440-02-0	mg/l	0.00279 J	<0.002	0.00285 J	0.0161 J
Selenium, Dissolved	7782-49-2	mg/l	0.00481 J	<0.002	0.00541 J	0.0114 J
Selenium, Total	7782-49-2	mg/l	0.00418 J	<0.002	0.00571 J	0.0126 J
Silver, Dissolved	7440-22-4	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Silver, Total	7440-22-4	mg/l	<0.0016	<0.0016	<0.0016	<0.004
Thallium, Dissolved	7440-28-0	mg/l	<0.002	<0.002	<0.002	<0.005
Thallium, Total	7440-28-0	mg/l	<0.002	<0.002	<0.002	<0.005
Vanadium, Dissolved	7440-62-2	mg/l	0.00575 J	<0.0018	0.0369	0.0184 J
Vanadium, Total	7440-62-2	mg/l	0.00617 J	<0.0018	0.0372	0.0185 J
Zinc, Dissolved	7440-66-6	mg/l	0.00671 J	0.00789 J	0.00752 J	<0.012
Zinc, Total	7440-66-6	mg/l	<0.004	0.0067 J	<0.004	<0.01
Mercury, Dissolved	7439-97-6	mg/l	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005
Mercury, Total	7439-97-6	mg/l	<4e-005	<4e-005	<4e-005	<4e-005
Cyanide	57-12-5	mg/l	<0.005	<0.005	<0.005	<0.005
Pesticides and PCBs						
4,4'-DDD	72-54-8	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
4,4'-DDE	72-55-9	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
4,4'-DDT	50-29-3	mg/l	<5e-005	2.10E-05	<2.5e-006	<2.5e-005
Aldrin	309-00-2	mg/l	<2.5e-005	<1.2e-006	<1.2e-006	<1.2e-005
alpha-BHC	319-84-6	mg/l	<2.5e-005	<1.2e-006	<1.2e-006	<1.2e-005
alpha-Chlordane	5103-71-9	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
beta-BHC	319-85-7	mg/l	<2.5e-005	<1.2e-006	1.60E-05	<1.2e-005
delta-BHC	319-86-8	mg/l	<2.5e-005	5.00E-06	2.00E-05	<1.2e-005
Dieldrin	60-57-1	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
Endosulfan I	959-98-8	mg/l	6.50E-05	2.90E-06	<1.2e-006	<1.2e-005
Endosulfan II	33213-65-9	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
Endosulfan sulfate	1031-07-8	mg/l	<5e-005	<2.5e-006	2.30E-05	<2.5e-005
Endrin	72-20-8	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
Endrin aldehyde	7421-93-4	mg/l	<5e-005	<2.5e-006	<2.5e-006	<2.5e-005
gamma-BHC	58-89-9	mg/l	<2.5e-005	<1.2e-006	<1.2e-006	<1.2e-005
gamma-Chlordane	5103-74-2	mg/l	<5e-005	<2.5e-006	6.70E-05	<2.5e-005
Heptachlor	76-44-8	mg/l	<2.5e-005	<1.2e-006	3.10E-05	<1.2e-005
Heptachlor epoxide	1024-57-3	mg/l	<2.5e-005	<1.2e-006	2.90E-05	<1.2e-005
Methoxychlor	72-43-5	mg/l	<0.00025	<1.2e-005	<1.2e-005	<0.00012
Toxaphene	8001-35-2	mg/l	<0.0005	<2.5e-005	<2.5e-005	<0.00025
Aroclor 1016	12674-11-2	mg/l	<0.0001	<0.0001	<0.0001	<0.0001

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not analyzed

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - North Pit Area
Brine Service Company Superfund Site

Sample Location Sample Date Sample ID			MWGW04 2/26/2014 MWGW04-022614	MWGW05 2/26/2014 MWGW05-022614	MWGW15 2/26/2014 MWGW15-022614	MWGW16 2/26/2014 MWGW16-022614
Analyte	CAS No.	Units				
Aroclor 1221	11104-28-2	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Aroclor 1232	11141-16-5	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Aroclor 1242	53469-21-9	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Aroclor 1248	12672-29-6	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Aroclor 1254	11097-69-1	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Aroclor 1260	11096-82-5	mg/l	<0.0001	<0.0001	<0.0001	<0.0001
Volatile Organic Compounds						
1,1,1,2-Tetrachloroethane	630-20-6	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
1,1,1-Trichloroethane	71-55-6	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
1,1,2,2-Tetrachloroethane	79-34-5	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	mg/l	<0.001	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	79-00-5	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
1,1-Dichloroethane	75-34-3	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
1,1-Dichloroethene	75-35-4	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
1,2,4-Trichlorobenzene	120-82-1	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
1,2,4-Trimethylbenzene	95-63-6	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
1,2-Dibromoethane	106-93-4	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
1,2-Dichlorobenzene	95-50-1	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichloroethane	107-06-2	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
1,2-Dichloropropane	78-87-5	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
1,3,5-Trimethylbenzene	108-67-8	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
1,3-Dichlorobenzene	541-73-1	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
1,4-Dichlorobenzene	106-46-7	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
2-Butanone	78-93-3	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
2-Hexanone	591-78-6	mg/l	<0.001	<0.001	<0.001	<0.001
4-Methyl-2-pentanone	108-10-1	mg/l	<0.0007	<0.0007	<0.0007	<0.0007
Acetone	67-64-1	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	mg/l	<0.0002	<0.0002	0.00035 J	<0.0002
Bromodichloromethane	75-27-4	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Bromoform	75-25-2	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
Bromomethane	74-83-9	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
Carbon disulfide	75-15-0	mg/l	<0.0006	<0.0006	<0.0006	<0.0006
Carbon tetrachloride	56-23-5	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	108-90-7	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Chloroethane	75-00-3	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Chloroform	67-66-3	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Chloromethane	74-87-3	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,2-Dichloroethene	156-59-2	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,3-Dichloropropene	10061-01-5	mg/l	<0.0001	<0.0001	<0.0001	<0.0001
Cyclohexane	110-82-7	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Dibromochloromethane	124-48-1	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Dichlorodifluoromethane	75-71-8	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Isopropylbenzene	98-82-8	mg/l	<0.0003	<0.0003	0.00045 J	<0.0003
Methyl acetate	79-20-9	mg/l	<0.001	<0.001	<0.001	<0.001
Methyl tert-butyl ether	1634-04-4	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Methylcyclohexane	108-87-2	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
Naphthalene	91-20-3	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
n-Butylbenzene	104-51-8	mg/l	<0.0004	<0.0004	<0.0004	<0.0004
n-Propylbenzene	103-65-1	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
sec-Butylbenzene	135-98-8	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Styrene	100-42-5	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
tert-Butylbenzene	98-06-6	mg/l	0.00031 J	<0.0003	0.0004 J	<0.0003
Tetrachloroethene	127-18-4	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Toluene	108-88-3	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
trans-1,2-Dichloroethene	156-60-5	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
trans-1,3-Dichloropropene	10061-02-6	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Trichloroethene	79-01-6	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Trichlorofluoromethane	75-69-4	mg/l	<0.0003	<0.0003	<0.0003	<0.0003
Vinyl chloride	75-01-4	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Xylenes, Total	1330-20-7	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Semivolatile Organic Compounds						
1,1-Biphenyl	92-52-4	mg/l	<3.2e-005	<3.2e-005	<3.2e-005	<3.2e-005
1-Methylnaphthalene	90-12-0	mg/l	<3e-005	<3e-005	<3e-005	<3e-005

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not analyzed

Groundwater Analytical Data Summary
Groundwater to Surface Water Pathway - North Pit Area
Brine Service Company Superfund Site

Sample Location Sample Date Sample ID			MWGW04 2/26/2014 MWGW04-022614	MWGW05 2/26/2014 MWGW05-022614	MWGW15 2/26/2014 MWGW15-022614	MWGW16 2/26/2014 MWGW16-022614
Analyte	CAS No.	Units				
2,4,5-Trichlorophenol	95-95-4	mg/l	<4e-005	<4e-005	0.00019 J	<4e-005
2,4,6-Trichlorophenol	88-06-2	mg/l	<6e-005	<6e-005	0.001	<6e-005
2,4-Dichlorophenol	120-83-2	mg/l	<6.5e-005	<6.5e-005	0.00029	<6.5e-005
2,4-Dimethylphenol	105-67-9	mg/l	<3.3e-005	<3.3e-005	0.00061	<3.3e-005
2,4-Dinitrophenol	51-28-5	mg/l	<5e-005	<5e-005	<5e-005	<5e-005
2,4-Dinitrotoluene	121-14-2	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
2,6-Dinitrotoluene	606-20-2	mg/l	<5e-005	<5e-005	<5e-005	<5e-005
2-Chloronaphthalene	91-58-7	mg/l	<4e-005	<4e-005	<4e-005	<4e-005
2-Chlorophenol	95-57-8	mg/l	<4e-005	<4e-005	<4e-005	<4e-005
2-Methylnaphthalene	91-57-6	mg/l	<3.4e-005	<3.4e-005	<3.4e-005	<3.4e-005
2-Methylphenol	95-48-7	mg/l	<3.3e-005	<3.3e-005	0.00019 J	<3.3e-005
2-Nitroaniline	88-74-4	mg/l	<3.8e-005	<3.8e-005	<3.8e-005	<3.8e-005
2-Nitrophenol	88-75-5	mg/l	<2.4e-005	<2.4e-005	<2.4e-005	<2.4e-005
3&4-Methylphenol	106-44-5	mg/l	<3e-005	<3e-005	0.00067	<3e-005
3,3' -Dichlorobenzidine	91-94-1	mg/l	<2.4e-005	<2.4e-005	<2.4e-005	<2.4e-005
3-Nitroaniline	99-09-2	mg/l	<5.6e-005	<5.6e-005	<5.6e-005	<5.6e-005
4,6-Dinitro-2-methylphenol	534-52-1	mg/l	<7.3e-005	<7.3e-005	<7.3e-005	<7.3e-005
4-Bromophenyl phenyl ether	101-55-3	mg/l	<4.7e-005	<4.7e-005	<4.7e-005	<4.7e-005
4-Chloro-3-methylphenol	59-50-7	mg/l	<2.2e-005	<2.2e-005	<2.2e-005	<2.2e-005
4-Chloroaniline	106-47-8	mg/l	<2.1e-005	<2.1e-005	<2.1e-005	<2.1e-005
4-Chlorophenyl phenyl ether	7005-72-3	mg/l	<4.3e-005	<4.3e-005	<4.3e-005	<4.3e-005
4-Nitroaniline	100-01-6	mg/l	<4e-005	<4e-005	<4e-005	<4e-005
4-Nitrophenol	100-02-7	mg/l	<6e-005	<6e-005	<6e-005	<6e-005
Acenaphthene	83-32-9	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
Acenaphthylene	208-96-8	mg/l	<2.1e-005	<2.1e-005	<2.1e-005	<2.1e-005
Acetophenone	98-86-2	mg/l	0.0066	0.0049	0.0085	0.0075
Anthracene	120-12-7	mg/l	<2e-005	<2e-005	<2e-005	<2e-005
Benz(a)anthracene	56-55-3	mg/l	<2.5e-005	<2.5e-005	<2.5e-005	<2.5e-005
Benzaldehyde	100-52-7	mg/l	<4.6e-005	<4.6e-005	0.00021	<4.6e-005
Benz(a)pyrene	50-32-8	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
Benz(b)fluoranthene	205-99-2	mg/l	<2.8e-005	<2.8e-005	<2.8e-005	<2.8e-005
Benz(g,h,i)perylene	191-24-2	mg/l	<2.6e-005	<2.6e-005	<2.6e-005	<2.6e-005
Benz(k)fluoranthene	207-08-9	mg/l	<2.8e-005	<2.8e-005	<2.8e-005	<2.8e-005
Bis(2-chloroethoxy)methane	111-91-1	mg/l	<2.2e-005	<2.2e-005	<2.2e-005	<2.2e-005
Bis(2-chloroethyl)ether	111-44-4	mg/l	<2.9e-005	<2.9e-005	<2.9e-005	<2.9e-005
Bis(2-chloroisopropyl)ether	108-60-1	mg/l	<6.4e-005	<6.4e-005	<6.4e-005	<6.4e-005
Bis(2-ethylhexyl)phthalate	117-81-7	mg/l	<3.3e-005	<3.3e-005	0.00016 J	0.00016 J
Butyl benzyl phthalate	85-68-7	mg/l	<2.1e-005	<2.1e-005	<2.1e-005	<2.1e-005
Caprolactam	105-60-2	mg/l	<5.9e-005	<5.9e-005	<5.9e-005	<5.9e-005
Carbazole	86-74-8	mg/l	<2.5e-005	<2.5e-005	<2.5e-005	<2.5e-005
Chrysene	218-01-9	mg/l	<4.6e-005	<4.6e-005	<4.6e-005	<4.6e-005
Dibenzo(a,h)anthracene	53-70-3	mg/l	<2.6e-005	<2.6e-005	<2.6e-005	<2.6e-005
Dibenzofuran	132-64-9	mg/l	<2.5e-005	<2.5e-005	<2.5e-005	<2.5e-005
Diethyl phthalate	84-66-2	mg/l	<2.1e-005	<2.1e-005	<2.1e-005	<2.1e-005
Dimethyl phthalate	131-11-3	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
Di-n-butyl phthalate	84-74-2	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
Di-n-octyl phthalate	117-84-0	mg/l	<2.3e-005	<2.3e-005	<2.3e-005	<2.3e-005
Fluoranthene	206-44-0	mg/l	<2e-005	<2e-005	<2e-005	<2e-005
Fluorene	86-73-7	mg/l	<2.1e-005	<2.1e-005	<2.1e-005	<2.1e-005
Hexachlorobenzene	118-74-1	mg/l	<7e-005	<7e-005	<7e-005	<7e-005
Hexachlorobutadiene	87-68-3	mg/l	<5e-005	<5e-005	<5e-005	<5e-005
Hexachlorocyclopentadiene	77-47-4	mg/l	<5.4e-005	<5.4e-005	<5.4e-005	<5.4e-005
Hexachloroethane	67-72-1	mg/l	<3.4e-005	<3.4e-005	<3.4e-005	<3.4e-005
Indeno(1,2,3-cd)pyrene	193-39-5	mg/l	<5.1e-005	<5.1e-005	<5.1e-005	<5.1e-005
Isophorone	78-59-1	mg/l	<3e-005	<3e-005	<3e-005	<3e-005
Naphthalene	91-20-3	mg/l	<5e-005	<5e-005	0.00016 J	<5e-005
Nitrobenzene	98-95-3	mg/l	<5e-005	<5e-005	<5e-005	<5e-005
N-Nitrosodi-n-propylamine	621-64-7	mg/l	<4e-005	<4e-005	<4e-005	<4e-005
N-Nitrosodiphenylamine	86-30-6	mg/l	<2.9e-005	<2.9e-005	<2.9e-005	<2.9e-005
Pentachlorophenol	87-86-5	mg/l	<4.6e-005	<4.6e-005	<4.6e-005	<4.6e-005
Phenanthrene	85-01-8	mg/l	<2e-005	<2e-005	<2e-005	<2e-005
Phenol	108-95-2	mg/l	<3.2e-005	<3.2e-005	0.00015 J	<3.2e-005
Pyrene	129-00-0	mg/l	0.00011 J	<2.2e-005	0.00014 J	<2.2e-005
Total PAHs	TPAH	mg/l	0.00011	ND	0.00030	ND

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not analyzed

Soil Analytical Data Summary - Background
Brine Service Company Superfund Site

Sample Location			BGSS01 1-2 ft	BGSS02 1-2 ft	BGSS03 0-0.5 ft	BGSS04 1-2 ft	BGSS05 1-2 ft	BGSS06 0-0.5 ft	BGSS06 0-0.5 ft	BGSS07 1-2 ft	BGSS08 1-2 ft	BGSS09 0-0.5 ft	BGSS10 0-0.5 ft	BGSS11 0-0.5 ft	BGSS12 1-2 ft	BGSS13 0-0.5 ft
Analyte	CAS No.	Units	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012
METALS																
Aluminum	7429-90-5	mg/kg	10300	7230	2180	6080	1640	1890	1820	1800	8790	1400	1430	3180	11400	1150
Antimony	7440-36-0	mg/kg	<0.2	<0.22	<0.19	<0.21	<0.19	<0.2	<0.18	<0.2	<0.21	<0.21	<0.2	<0.2	<0.2	<0.2
Arsenic	7440-38-2	mg/kg	2.28	1.66	1.27	1.21	1.18	1.19	1.12	1.53	1.56	0.833	0.983	1.35	1.79	0.747
Barium	7440-39-3	mg/kg	26.6	51.5	25.9	35.7	10.3	35.4	41.1	19	18.2	23.4	19.4	51.7	49	23.2
Beryllium	7440-41-7	mg/kg	0.552	0.366 J	0.136 J	0.134 J	0.132 J	0.141 J	0.13 J	0.426 J	0.112 J	0.0911 J	0.168 J	0.553	0.0839 J	
Cadmium	7440-43-9	mg/kg	0.0643 J	0.0818 J	1.02	0.0735 J	<0.047	1.25	1.44	0.948	0.085 J	1.06	0.552	1.42	<0.05	0.749
Chromium	7440-47-3	mg/kg	5.45	4.15	2.06	3.51	1.64	2.57	2.54	1.94	4.89	2.04	1.62	3.14	6.04	1.63
Cobalt	7440-48-4	mg/kg	2.42	1.08	0.967	1.51	1.11	1.55	1.49	0.998	0.963	1.13	0.788	1.21	3.19	0.774
Copper	7440-50-8	mg/kg	2.83	2	3.43	2.1	1.13	4.58	4.97	3.11	1.68	4	2.25	5.92	3.35	2.72
Lead	7439-92-1	mg/kg	6.05	4.4	13.7	3.63	2.83	16.3	18.3	8.81	4.57	16.9	6.3	16.5	5.22	9.63
Manganese	7439-96-5	mg/kg	38.1	32.7	48.8	43.3	66.2	113	116	59.6	22	72.9	44.8	65.6	45.8	55.8
Nickel	7440-02-0	mg/kg	3.98	2.7	1.38	2.57	1.06	1.42	1.51	1.23	2.69	0.996	0.968	2.11	4.31	1.07
Selenium	7782-49-2	mg/kg	0.89	0.772	0.31 J	0.581	0.323 J	0.721	0.516	0.415 J	0.563	0.412 J	0.376 J	0.549	0.887	0.371 J
Silver	7440-22-4	mg/kg	<0.079	<0.087	<0.075	<0.082	<0.075	<0.081	0.0792 J	<0.079	<0.086	<0.084	<0.08	0.0828 J	<0.08	<0.08
Thallium	7440-28-0	mg/kg	0.0951 J	<0.076	<0.066	0.119 J	<0.066	<0.071	0.0923 J	<0.069	0.0777 J	<0.073	<0.07	<0.071	0.107 J	<0.07
Vanadium	7440-62-2	mg/kg	11.2	9.01	4.79	6.13	4.59	5.23	5.02	5.14	8.56	4.06	4.1	6.62	10.8	3.84
Zinc	7440-66-6	mg/kg	16.4	14.8	77.4	13.9	4.65	89.2	97.8	54.4	13.9	71.3	37.6	102	17	52
Mercury	7439-97-6	mg/kg	0.00841	0.01	0.0445	0.00827	0.00671	0.0334	0.0289	0.0251	0.0242	0.0444	0.0135	0.0193	0.00658	0.0269
Cyanide	57-12-5	mg/kg	<0.68	<0.71	<0.64	<0.66	<0.63	<0.64	<0.62	<0.63	<0.7	<0.66	1.56 J	<0.66	<0.68	<0.65
PESTICIDES AND PCBs																
4,4'-DDD	72-54-8	mg/kg	<0.00056	<0.00059	<0.00053	<0.00055	0.0019 J	<0.00054	<0.00051	<0.00052	<0.00058	<0.00055	<0.00054	<0.00055	<0.00057	<0.00054
4,4'-DDE	72-55-9	mg/kg	<0.00056	<0.00059	<0.00053	<0.00055	0.001 J	<0.00054	<0.00051	<0.00052	<0.00058	<0.00055	0.009	<0.00055	<0.00057	<0.00054
4,4'-DDT	50-29-3	mg/kg	<0.00056	<0.00059	<0.00053	<0.00055	0.0042	<0.00054	<0.00051	<0.00052	<0.00058	<0.00055	<0.00054	<0.00055	<0.00057	<0.00054
Aldrin	309-00-2	mg/kg	<0.00034	<0.00035	<0.00032	<0.00033	<0.00031	<0.00032	<0.00031	<0.00033	<0.00032	<0.00032	<0.00033	<0.00032	<0.00034	<0.00032
alpha-BHC	319-84-6	mg/kg	<0.00034	<0.00035	<0.00032	<0.00033	<0.00031	<0.00032	<0.00031	<0.00033	<0.00033	<0.00032	<0.00033	<0.00034	<0.00032	
alpha-Chlordane	5103-71-9	mg/kg	<0.00022	<0.00023	<0.00021	<0.00022	<0.00021	<0.00021	<0.00021	<0.00022	<0.00023	<0.00022	<0.00021	<0.00022	<0.00023	<0.00022
beta-BHC	319-85-7	mg/kg	<0.00034	<0.00035	<0.00032	<0.00033	<0.00031	<0.00032	<0.00031	<0.00033	<0.00035	<0.00033	<0.00032	<0.00033	<0.00034	<0.00032
delta-BHC	319-86-8	mg/kg	<0.00022	<0.00023	<0.00021	<0.00022	<0.00021	<0.00021	<0.00021	<0.00022	<0.00023	<0.00022	<0.00021	<0.00022	<0.00023	<0.00022
Dieldrin	60-57-1	mg/kg	<0.00056	<0.00059	<0.00053	<0.00055	<0.00052	<0.00054	<0.00051	<0.00052	<0.00058	<0.00055	<0.00054	<0.00057	<0.00054	
Endosulfan I	959-98-8	mg/kg	<0.00034	<0.00035	<0.00032	<0.00033	<0.00031	<0.00032	<0.00031	<0.						

Soil Analytical Data Summary - Background
Brine Service Company Superfund Site

Sample Location			BGSS01 1-2 ft	BGSS02 1-2 ft	BGSS03 0-0.5 ft	BGSS04 1-2 ft	BGSS05 1-2 ft	BGSS06 0-0.5 ft	BGSS07 1-2 ft	BGSS08 1-2 ft	BGSS09 0-0.5 ft	BGSS10 0-0.5 ft	BGSS11 0-0.5 ft	BGSS12 1-2 ft	BGSS13 0-0.5 ft	
Analyte	CAS No.	Units	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	3/21/2012	
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
4-Nitroaniline	100-01-6	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
4-Nitrophenol	100-02-7	mg/kg	<0.0037	<0.0039	<0.0035	<0.0036	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0038	<0.0036	<0.0035	<0.0036	<0.0036
Acenaphthene	83-32-9	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Acenaphthylene	208-96-8	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Acetophenone	98-86-2	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Anthracene	120-12-7	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Benz(a)anthracene	56-55-3	mg/kg	<0.0018	<0.0019	0.0033 J	<0.0018	<0.0017	0.0061 J	0.0086	0.002 J	<0.0019	0.0075	0.002 J	0.0076	<0.0018	0.0036 J
Benzaldehyde	100-52-7	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Benzo(a)pyrene	50-32-8	mg/kg	<0.0018	<0.0019	0.004 J	<0.0018	<0.0017	0.0088	0.012	0.0021 J	<0.0019	0.0092	0.0027 J	0.01	<0.0018	0.0063 J
Benzo(b)fluoranthene	205-99-2	mg/kg	<0.0018	<0.0019	0.0054 J	<0.0018	<0.0017	0.0096	0.013	0.0037 J	<0.0019	0.011	0.0038 J	0.014	<0.0018	0.0085
Benzo(g,h,i)perylene	191-24-2	mg/kg	<0.0019	<0.002	0.0036 J	<0.0019	<0.0018	0.0086	0.012	0.0027 J	<0.002	0.0074	0.0035 J	0.011	<0.0019	0.0057 J
Benzo(k)fluoranthene	207-08-9	mg/kg	<0.0018	<0.0019	0.0024 J	<0.0018	<0.0017	0.0044 J	0.0055 J	<0.0017	<0.0019	0.0041 J	0.0022 J	0.0044 J	<0.0018	0.0031 J
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0017	<0.0018	<0.0017
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	<0.0018	<0.0019	0.0041 J	0.0079	<0.0017	0.0048 J	0.0073	<0.0017	<0.0019	0.0047 J	<0.0017	0.0097	<0.0018	0.0049 J
Butyl benzyl phthalate	85-68-7	mg/kg	<0.0032	<0.0033	0.0043 J	<0.0031	<0.0029	<0.003	<0.0029	<0.0033	<0.0031	<0.003	<0.0031	<0.0032	<0.003	<0.003
Caprolactam	105-60-2	mg/kg	<0.0023	<0.0023	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021	<0.0023	<0.0022	<0.0021	<0.0022	<0.0023	<0.0022
Carbazole	86-74-8	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0018	<0.0017	<0.0017
Chrysene	218-01-9	mg/kg	<0.0018	<0.0019	0.0043 J	<0.0018	<0.0017	0.0084	0.011	0.002 J	<0.0019	0.011	0.003 J	0.012	<0.0018	0.0063 J
Dibenz(a,h)anthracene	53-70-3	mg/kg	<0.0023	<0.0023	<0.0021	<0.0022	<0.0021	0.003 J	0.0039 J	<0.0021	<0.0023	<0.0022	<0.0021	0.0031 J	<0.0023	<0.0022
Dibenzofuran	132-64-9	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0018	<0.0017	<0.0017
Diethyl phthalate	84-66-2	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0018	<0.0017	<0.0017
Dimethyl phthalate	131-11-3	mg/kg	<0.0023	<0.0023	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021	<0.0023	<0.0022	<0.0021	<0.0022	<0.0023	<0.0022
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0023	<0.0023	<0.0021	<0.0022	<0.0021	0.021	0.024	<0.0021	<0.0023	<0.0022	0.0033 J	0.011	<0.0023	<0.0022
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0023	<0.0023	<0.0021	<0.0022	<0.0021	<0.0021	<0.0017	<0.0021	<0.0023	<0.0022	<0.0021	<0.0022	<0.0023	<0.0022
Fluoranthene	206-44-0	mg/kg	<0.0018	<0.0019	0.0055 J	<0.0018	<0.0017	0.0097	0.015	0.0032 J	<0.0019	0.012	0.0047 J	0.013	<0.0018	0.008
Fluorene	86-73-7	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017	<0.0019	<0.0017	<0.0017	<0.0018	<0.0017	<0.0017
Hexachlorobenzene	118-74-1	mg/kg	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	<0.0017	<0.0016	<0.0017						

Surface Water Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Sample Location		EDBSW01	EDBSW02	EDBSW02	EDBSW03	EDBSW04
		Sample Date	T/D	10/5/2010	10/6/2010	10/6/2010	10/6/2010	11/15/2010
METALS								
Aluminum#	7429-90-5	T	mg/l	0.687	0.375	0.376	0.174	1.38
Aluminum#	7429-90-5	D	mg/l	0.404	0.166	0.190	0.0931	0.282
Antimony	7440-36-0	T	mg/l	<0.0005	0.0011 J	0.00112 J	0.00109 J	<0.0005
Arsenic	7440-38-2	T	mg/l	0.0221	0.0232	0.0247	0.024	0.00436 J
Barium	7440-39-3	T	mg/l	0.208	0.194	0.213	0.209	0.253
Beryllium	7440-41-7	T	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cadmium	7440-43-9	D	mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Chromium	7440-47-3	D	mg/l	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Cobalt	7440-48-4	T	mg/l	0.00156 J	0.00222 J	0.00232 J	0.00286 J	<0.0005
Copper	7440-50-8	D	mg/l	<0.0005	0.00149 U	0.00167 U	0.0012 U	0.00315 J
Lead	7439-92-1	D	mg/l	0.000842 J	0.000488 J	0.000537 J	0.00055 J	0.00131 J
Manganese#	7439-96-5	T	mg/l	0.332	0.145	0.139	0.295	0.0685
Nickel	7440-02-0	D	mg/l	0.00336 J	0.00421 J	0.00472 J	0.0046 J	0.00187 J
Selenium	7782-49-2	T	mg/l	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Silver	7440-22-4	D	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Thallium	7440-28-0	T	mg/l	<0.0008	0.000825 J	<0.0008	<0.0008	<0.0008
Vanadium	7440-62-2	T	mg/l	0.00195 J	0.102	0.0107	0.00728	0.00907
Zinc	7440-66-6	D	mg/l	0.00624	0.00328 U	0.00529 U	0.00353 U	0.00652
Mercury	7439-97-6	T	mg/l	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005
Cyanide#	57-12-5	T	mg/l	<0.004	0.29	<0.004	<0.004	<0.004
PESTICIDES AND PCBs								
4,4'-DDD#	72-54-8	N	mg/l	1.3e-005 J	<2.5e-006	<2.5e-005	<2.5e-006	<2.5e-006 JL
4,4'-DDE	72-55-9	N	mg/l	2.8e-006 J	<2.5e-006	<2.5e-005	<2.5e-006	<2.5e-006 JL
4,4'-DDT#	50-29-3	N	mg/l	5.10E-06	<2.5e-006 J	5.4e-005 J	<2.5e-006	<2.5e-006 JL
Aldrin	309-00-2	N	mg/l	<1.2e-006	<1.2e-006	<1.2e-005	<1.2e-006	<1.2e-006 JL
alpha-BHC	319-84-6	N	mg/l	<1.2e-006	<1.2e-006	<1.2e-005	<1.2e-006	<1.2e-006 JL
alpha-Chlordane#	5103-71-9	N	mg/l	<2.5e-006	<2.5e-006	3.60E-05	1.2e-005 J	<2.5e-006 JL
beta-BHC	319-85-7	N	mg/l	0.000011	<1.2e-006	<1.2e-005	<1.2e-006	<1.2e-006 JL
delta-BHC	319-86-8	N	mg/l	8.3e-006 JL	<1.2e-006 JL	<1.2e-005 JL	3.2e-006 JL	<1.2e-006 JL
Dieldrin#	60-57-1	N	mg/l	8.5e-006 J	<2.5e-006	<2.5e-005	5.6e-006 J	<2.5e-006 JL
Endosulfan I	959-98-8	N	mg/l	3.7e-006 J	<1.2e-006	<1.2e-005	<1.2e-006	<1.2e-006 JL
Endosulfan II	33213-65-9	N	mg/l	<2.5e-006	<2.5e-006	<2.5e-005	<2.5e-006	<2.5e-006 JL
Endosulfan sulfate	1031-07-8	N	mg/l	4.4e-006 J	<2.5e-006	<2.5e-005	<2.5e-006	<2.5e-006 JL
Endrin#	72-20-8	N	mg/l	<2.5e-006	<2.5e-006	<2.5e-005	9.6e-006 J	<2.5e-006 JL
Endrin aldehyde	7421-93-4	N	mg/l	1e-005 J	<2.5e-006	<2.5e-005	<2.5e-006	<2.5e-006 JL
gamma-BHC	58-89-9	N	mg/l	0.0000077	<1.2e-006	<1.2e-005	0.0000056	<1.2e-006 JL
gamma-Chlordane#	5103-74-2	N	mg/l	7e-005 J	1e-005 J	<2.5e-005	2.80E-05	<2.5e-006 JL
Heptachlor	76-44-8	N	mg/l	<1.2e-006	<1.2e-006	<1.2e-005	<1.2e-006	1.8e-006 JL
Heptachlor epoxide#	1024-57-3	N	mg/l	2.50E-05	<1.2e-006	1.8e-005 J	<1.2e-006	<1.2e-006 JL
Methoxychlor	72-43-5	N	mg/l	<1.2e-005	<1.2e-005	<0.00012	<1.2e-005	<1.2e-005 JL
Toxaphene	8001-35-2	N	mg/l	<2.5e-005	<2.5e-005	<0.00025	<2.5e-005	<2.5e-005 JL
Aroclor 1016	12674-11-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1221	11104-28-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1232	11141-16-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1242	53469-21-9	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1248	12672-29-6	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1254	11097-69-1	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1260	11096-82-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
VOLATILE ORGANIC COMPOUNDS								
1,1,1,2-Tetrachloroethane	630-20-6	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
1,1,1-Trichloroethane	71-55-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1,2,2-Tetrachloroethane	79-34-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1,2-Trichloroethane	79-00-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethane	75-34-3	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
1,1-Dichloroethene	75-35-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
1,2,4-Trichlorobenzene	120-82-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,2,4-Trimethylbenzene	95-63-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,2-Dibromoethane	106-93-4	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Bolded - detection above the SDE

< - Analyte not detected above the SDE

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

Surface Water Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Sample Location		EDBSW01	EDBSW02	EDBSW02	EDBSW03	EDBSW04
		Sample Date	T/D	10/5/2010	10/6/2010	10/6/2010	10/6/2010	11/15/2010
1,2-Dichlorobenzene	95-50-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,2-Dichloroethane	107-06-2	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,2-Dichloropropane	78-87-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,3,5-Trimethylbenzene	108-67-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,3-Dichlorobenzene	541-73-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,4-Dichlorobenzene	106-46-7	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
2-Butanone	78-93-3	N	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
2-Hexanone	591-78-6	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4-Methyl-2-pentanone	108-10-1	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Acetone	67-64-1	N	mg/l	0.0034 U	0.0028	0.0024	0.0071	0.0021
Benzene	71-43-2	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bromodichloromethane	75-27-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bromoform	75-25-2	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Bromomethane	74-83-9	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Carbon disulfide	75-15-0	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Carbon tetrachloride	56-23-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloroethane	75-00-3	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Chloroform	67-66-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloromethane	74-87-3	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,2-Dichloroethene	156-59-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
cis-1,3-Dichloropropene	10061-01-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cyclohexane	110-82-7	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dibromochloromethane	124-48-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dichlorodifluoromethane	75-71-8	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Ethylbenzene	100-41-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Isopropylbenzene	98-82-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Methyl acetate	79-20-9	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Methyl tert-butyl ether	1634-04-4	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Methylcyclohexane	108-87-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Methylene chloride	75-09-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Naphthalene	91-20-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
n-Propylbenzene	103-65-1	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
sec-Butylbenzene	135-98-8	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Styrene	100-42-5	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tetrachloroethene	127-18-4	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Toluene	108-88-3	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
trans-1,2-Dichloroethene	156-60-5	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
trans-1,3-Dichloropropene	10061-02-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trichloroethene	79-01-6	N	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trichlorofluoromethane	75-69-4	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	N	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Xylenes, Total	1330-20-7	N	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
SEMITOLVATILE ORGANIC COMPOUNDS								
1,1'-Biphenyl	92-52-4	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
1-Methylnaphthalene	90-12-0	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
2,4,5-Trichlorophenol	95-95-4	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
2,4,6-Trichlorophenol	88-06-2	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
2,4-Dichlorophenol	120-83-2	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
2,4-Dimethylphenol	105-67-9	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
2,4-Dinitrophenol	51-28-5	N	mg/l	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
2,4-Dinitrotoluene	121-14-2	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
2,6-Dinitrotoluene	606-20-2	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
2-Chloronaphthalene	91-58-7	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
2-Chlorophenol	95-57-8	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
2-Methylnaphthalene	91-57-6	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
2-Methylphenol	95-48-7	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
2-Nitroaniline	88-74-4	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
2-Nitrophenol	88-75-5	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
3&4-Methylphenol	106-44-5	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL

Bolded - detection above the SDE

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

Surface Water Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Sample Location		EDBSW01	EDBSW02	EDBSW02	EDBSW03	EDBSW04
		Sample Date	T/D	10/5/2010	10/6/2010	10/6/2010	10/6/2010	11/15/2010
3,3'-Dichlorobenzidine	91-94-1	N	mg/l	<7e-005 JL				
3-Nitroaniline	99-09-2	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
4,6-Dinitro-2-methylphenol	534-52-1	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
4-Bromophenyl phenyl ether	101-55-3	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
4-Chloro-3-methylphenol	59-50-7	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
4-Chloroaniline	106-47-8	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
4-Chlorophenyl phenyl ether	7005-72-3	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
4-Nitroaniline	100-01-6	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
4-Nitrophenol	100-02-7	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Acenaphthene	83-32-9	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Acenaphthylene	208-96-8	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Acetophenone	98-86-2	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Anthracene	120-12-7	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Benz(a)anthracene	56-55-3	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Benzaldehyde	100-52-7	N	mg/l	<0.00012 JL				
Benzo(a)pyrene	50-32-8	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
Benzo(b)fluoranthene	205-99-2	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Benzo(g,h,i)perylene	191-24-2	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Benzo(k)fluoranthene	207-08-9	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Bis(2-chloroethoxy)methane	111-91-1	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Bis(2-chloroethyl)ether	111-44-4	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Bis(2-chloroisopropyl)ether	108-60-1	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Bis(2-ethylhexyl)phthalate	117-81-7	N	mg/l	0.0014 UJL	0.0011 UJL	0.0011 UJL	0.00096 UJL	<0.0002 JL
Butyl benzyl phthalate	85-68-7	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Caprolactam	105-60-2	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
Carbazole	86-74-8	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Chrysene	218-01-9	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Dibenz(a,h)anthracene	53-70-3	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
Dibenzofuran	132-64-9	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
Diethyl phthalate	84-66-2	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Dimethyl phthalate	131-11-3	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Di-n-butyl phthalate	84-74-2	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Di-n-octyl phthalate	117-84-0	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Fluoranthene	206-44-0	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Fluorene	86-73-7	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Hexachlorobenzene	118-74-1	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Hexachlorobutadiene	87-68-3	N	mg/l	<0.000015	<0.000015 JL	<0.000015 JL	<0.000015 JL	<0.000015 JL
Hexachlorocyclopentadiene	77-47-4	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005 JL	<8e-005 JL
Hexachloroethane	67-72-1	N	mg/l	<0.00017	<0.00017 JL	<0.00017 JL	<0.00017 JL	<0.00017 JL
Indeno(1,2,3-cd)pyrene	193-39-5	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Isophorone	78-59-1	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Naphthalene	91-20-3	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
Nitrobenzene	98-95-3	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
N-Nitrosodi-n-propylamine	621-64-7	N	mg/l	<0.0001	<0.0001 JL	<0.0001 JL	<0.0001 JL	<0.0001 JL
N-Nitrosodiphenylamine	86-30-6	N	mg/l	<9e-005	<9e-005 JL	<9e-005 JL	<9e-005 JL	<9e-005 JL
Pentachlorophenol	87-86-5	N	mg/l	<8e-005 JL				
Phenanthrene	85-01-8	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Phenol	108-95-2	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Pyrene	129-00-0	N	mg/l	<7e-005	<7e-005 JL	<7e-005 JL	<7e-005 JL	<7e-005 JL
Total PAHs		TPAH	N	mg/l	<0.000725	<0.000725	<0.000725	<0.000725

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

Sediment Analytical Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	Sample Location	Depth Interval	Sample Date	EDBSS01	EDBSS01	EDBSS02	EDBSD03	EDBSS04	EDBSD05	EDBSD06	EDBSD07	EDBSD08	EDBSD09	EDBSD10	EDBSD11	EDBSD08	EDBSD08-DUP			
	CAS No.			0-0.5 ft	10/5/2010	0-0.5 ft	10/5/2010	0-0.5 ft	10/5/2010	0-0.5 ft	10/6/2010	0-0.5 ft	10/6/2010	0-0.5 ft	11/15/2010	0-0.5 ft	11/15/2010	0-0.5 ft	10/25/2017	0-0.5 ft
METALS																				
Aluminum	7429-90-5	mg/kg	16300	15100	13000	10700	12300	8250	4550	4580	6960	6320	10500	10500	9240	2.04E+04	2.12E+04			
Antimony	7440-36-0	mg/kg	<0.3	<0.31	<0.31	<0.34	<0.33	<0.31	<0.28	<0.3	<0.29	<0.31	<0.36	<0.35	<0.32	<0.26	<0.263			
Arsenic	7440-38-2	mg/kg	3.08	3.03	4.15	2.81	3.99	2.73	2.17	1.97	2.21	2.47	2.53	2.72	2.88	3.65E+00	2.56E+00			
Barium	7440-39-3	mg/kg	168	174	205	454	118	131	97	97.7	123	465	150	200	350	3.43E+02	4.07E+02			
Beryllium	7440-41-7	mg/kg	0.912	0.886	0.813	0.671 J	0.664	0.472 J	0.297 J	0.283 J	0.4 J	0.318 J	0.545 J	0.527 J	0.506 J	8.60E-01	8.63E-01			
Cadmium	7440-43-9	mg/kg	0.353 J	0.351 J	0.449 J	0.445 J	0.2 J	0.178 J	0.119 J	0.117 J	0.135 J	0.166 J	0.153 J	0.181 J	0.224 J	6.94E-01	5.90E-01			
Chromium	7440-47-3	mg/kg	11.7	10.5	11.2	7.75	8.06	5.65	3.35	3.23	4.73	4.21	5.9	5.69	5.92	1.76E+01	1.73E+01			
Cobalt	7440-48-4	mg/kg	6.23	7.21	8.33	6.89	4.88	3.83	2.28	1.99	2.79	3.55	3.73	3.91	5.19	6.20E+00	5.85E+00			
Copper	7440-50-8	mg/kg	14.1	13.1	18.7	10.9	8.04	4.94	2.91	2.78	4	5.23	5.7	5.59	7.15	1.70E+01	1.76E+01			
Lead	7439-92-1	mg/kg	21.5	20.1	27.7	21.1	16.2	7.76	4.54	3.96	5.8	14.2	7.95	8.44	14.5	2.72E+01	2.08E+01			
Manganese	7439-96-5	mg/kg	294	407	616	505	309	265	121	112	159	258	236	247	336	2.37E+02	2.34E+02			
Nickel	7440-02-0	mg/kg	10.2	10.1	13.1	8.02	7.98	4.82	2.95	2.88	4.08	4.23	5.8	7.02	6.73	1.15E+01	1.18E+01			
Selenium	7782-49-2	mg/kg	0.614	0.427 J	0.522 J	0.528 J	0.445 J	0.347 J	<0.28	<0.3	<0.29	0.489 J	0.68 J	0.523 J	0.65	5.35E-01	9.20E-01			
Silver	7440-22-4	mg/kg	0.0841 J	0.0851 J	0.0821 J	0.0663 J	0.0581 J	<0.05	<0.045	<0.049	<0.047	<0.05	<0.057	<0.055	<0.051	<0.104	<0.105			
Thallium	7440-28-0	mg/kg	0.433 J	0.308 J	0.281 J	0.228 J	0.247 J	0.257 J	0.274 J	0.163 J	0.168 J	<0.087	0.159 J	0.136 J	0.106 J	2.50E-01	2.53E-01			
Vanadium	7440-62-2	mg/kg	14.8	13.3	12.3	10.9	13.1	13.2	9.19	8.4	10.7	11.9	12.3	12.5	14	3.13E+01	3.01E+01			
Zinc	7440-66-6	mg/kg	72.1	62.3	63.3	51.6	30.7	22.7	11.5	11.2	18	25.5	21.4	24.4	33.7	1.11E+02	1.09E+02			
Mercury	7439-97-6	mg/kg	0.0323	0.0308	0.0635	0.0614	0.0182	0.004 J	0.00176 J	0.00256 J	0.00689	0.0105	0.00391 J	0.0102	0.0293	3.20E-02	2.22E-02			
Cyanide	57-12-5	mg/kg	<0.76	<0.75	<0.8	<0.89	<0.79	<0.8	<0.71	<0.69	<0.73	<0.8	<0.88	<0.89	<0.86	---	---			
PESTICIDES AND PCBs																				
4,4'-DDD	72-54-8	mg/kg	<0.00068	<0.00068	<0.0007	<0.00076	<0.00067	<0.00071	<0.00062	<0.00061	<0.00065	<0.00067	<0.00074	<0.00075	<0.00072	---	---			
4,4'-DDE	72-55-9	mg/kg	<0.00068	<0.00068	<0.0007	<0.00076	<0.00067	<0.00071	<0.00062	<0.00061	<0.00065	<0.00067	<0.00074	<0.00075	<0.00072	---	---			
4,4'-DDT	50-29-3	mg/kg	<0.00068	<0.00068	<0.0007	<0.00076	<0.00067	<0.00071	<0.00062	<0.00061	<0.00065	<0.00067	<0.00074	<0.00075	<0.00072	---	---			
Aldrin	309-00-2	mg/kg	<0.00041	<0.00041	<0.00042	<0.00046	<0.0004	<0.00043	<0.00037	<0.00037	<0.00039	<0.0004	<0.00045	<0.00045	<0.00043	---	---			
alpha-BHC	319-84-6	mg/kg	<0.00041	<0.00041	<0.00042	<0.00046	<0.0004	<0.00043	<0.00037	<0.00037	<0.00039	<0.0004	<0.00045	<0.00045	<0.00043	---	---			
alpha-Chlordane	5103-71-9	mg/kg	<0.00027	<0.00027	<0.00028	<0.0003	<0.00027	<0.00028	<0.00025	<0.00024	<0.00026	<0.00027	<0.0003	<0.00029	---	---				
beta-BHC	319-85-7	mg/kg	<0.00041	<0.00041	<0.00042	<0.00046	<0.0004	<0.00043	<0.00037	<0.00037	<0.00039	<0.0004	<0.00045	<0.00045	<0.00043	---	---			
delta-BHC	319-86-8	mg/kg	<0.00027	<0.00027	<0.00028	<0.0003	<0.00027	<0.00028	<0.00025	<0.00024	<0.00026	<0.00027	<0.0003	<0.00029	---	---				

Sediment Analytical Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date	EDBSS01 0-0.5 ft	EDBSS01 0-0.5 ft	EDBSS02 0-0.5 ft	EDBSSD03 0-0.5 ft	EDBSS04 0-0.5 ft	EDBSSD05 0-0.5 ft	EDBSSD06 0-0.5 ft	EDBSSD07 0-0.5 ft	EDBSSD08 0-0.5 ft	EDBSSD09 0-0.5 ft	EDBSSD10 0-0.5 ft	EDBSSD11 0-0.5 ft	EDBSSD08-DUP 0-0.5 ft	
		CAS No.	Units	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/6/2010	10/6/2010	11/15/2010	11/15/2010	11/15/2010	10/25/2017	10/25/2017
1,4-Dichlorobenzene	106-46-7	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
2-Butanone	78-93-3	mg/kg	<0.0018	<0.0018	<0.0021	<0.0021	<0.0017	<0.002	<0.0018	<0.0017	<0.0018	0.0061 J	<0.0021	<0.0021	<0.002
2-Hexanone	591-78-6	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0013	<0.0015	<0.0014	<0.002
4-Methyl-2-pentanone	108-10-1	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0013	<0.0015	<0.0014	<0.002
Acetone	67-64-1	mg/kg	<0.0026	<0.0026	<0.003 U	<0.003	<0.0024 U	<0.0028	<0.0025	<0.0025	0.023 J	0.027	<0.003	<0.003	<0.0029
Benzene	71-43-2	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Bromodichloromethane	75-27-4	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Bromoform	75-25-2	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Bromomethane	74-83-9	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0015	<0.0015	<0.0014	<0.002
Carbon disulfide	75-15-0	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0015	<0.0015	<0.0014	<0.002
Carbon tetrachloride	56-23-5	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Chlorobenzene	108-90-7	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Chloroethane	75-00-3	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0015	<0.0015	<0.0014	<0.002
Chloroform	67-66-3	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Chloromethane	74-87-3	mg/kg	<0.0013	<0.0013	<0.0015	<0.0015	<0.0012	<0.0014	<0.0013	<0.0012	<0.0013	<0.0015	<0.0015	<0.0014	<0.002
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Cyclohexane	110-82-7	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Dibromochloromethane	124-48-1	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Ethylbenzene	100-41-4	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Isopropylbenzene	98-82-8	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Methyl acetate	79-20-9	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Methylcyclohexane	108-87-2	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Methylene chloride	75-09-2	mg/kg	0.0115 J	0.0119 J	<0.0015	0.002 J	0.0016 J	0.0017 J	0.0013 J	0.0014 J	<0.0013	<0.0015	<0.0015	<0.0014	<0.002
Naphthalene	91-20-3	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
n-Butylbenzene	104-51-8	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
n-Propylbenzene	103-65-1	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
sec-Butylbenzene	135-98-8	mg/kg	<0.00065	<0.00065	<0.00074	<0.00076	<0.00061	<0.00071	<0.00063	<0.00061	<0.00065	<0.00067	<0.00075	<0.00076	<0.00072
Styrene	100-42-5	mg/kg	<0.00065	<0.00065	<0.00074	<0.0007									

Sediment Analytical Data Summary
Background/Upstream East Ditch
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date		EDBSS01 0-0.5 ft 10/5/2010	EDBSS01 0-0.5 ft 10/5/2010	EDBSS02 0-0.5 ft 10/5/2010	EDBSD03 0-0.5 ft 10/5/2010	EDBSS04 0-0.5 ft 10/5/2010	EDBSD05 0-0.5 ft 10/6/2010	EDBSD06 0-0.5 ft 10/6/2010	EDBSD06 0-0.5 ft 10/6/2010	EDBSD07 0-0.5 ft 11/15/2010	EDBSD08 0-0.5 ft 11/15/2010	EDBSD09 0-0.5 ft 11/15/2010	EDBSD10 0-0.5 ft 11/15/2010	EDBSD11 0-0.5 ft 11/15/2010	EDBSD08 0-0.5 ft 10/25/2017	EDBSD08-DUP 0-0.5 ft 10/25/2017
	CAS No.	Units															
4-Nitrophenol	100-02-7	mg/kg	<0.0052	<0.0052	<0.0053	<0.0058	<0.0051	<0.0054 JL	<0.0048 JL	<0.0047	<0.0049	<0.0051	<0.0057 JL	<0.0057 JL	<0.0055 JL	---	---
Acenaphthene	83-32-9	mg/kg	<0.003	<0.003	0.26	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	<0.0032 JL	<0.0007	<0.00071
Acenaphthylene	208-96-8	mg/kg	<0.003	<0.003	<0.0031	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	<0.0032 JL	<0.0014	<0.0014
Acetophenone	98-86-2	mg/kg	<0.0033	<0.0033	<0.0034	<0.0037	<0.0032	<0.0034	<0.003	<0.0029	<0.0031	<0.0032	<0.0036 JL	<0.0036 JL	<0.0035 JL	---	---
Anthracene	120-12-7	mg/kg	<0.003	<0.003	0.072	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	0.0036 JL	7.90E-04	1.90E-03
Benz(a)anthracene	56-55-3	mg/kg	<0.0038	0.11	0.4	<0.0043	<0.0037	<0.004	<0.0035	<0.0034	<0.0036	0.0058 J	0.0063 JL	<0.0042 JL	0.025 JL	5.70E-03	7.60E-03
Benzaldehyde	100-52-7	mg/kg	<0.0062 JL	<0.0063 JL	<0.0064 JL	<0.0061 JL	<0.0065 JL	<0.0058 JL	<0.0056 JL	<0.006 JL	<0.0062 JL	<0.0069 JL	<0.0069 JL	<0.0066 JL	---	---	
Benzo(a)pyrene	50-32-8	mg/kg	<0.0031	0.089 J	0.37	<0.0035	<0.0031	<0.0033	<0.0029	<0.0028	<0.003	0.0062 J	<0.0034 JL	<0.0035 JL	0.023 JL	5.30E-03	7.20E-03
Benzo(b)fluoranthene	205-99-2	mg/kg	<0.0045	0.017	0.6	<0.005	<0.0044	<0.0047	<0.0041	<0.004	<0.0043	0.0081 J	0.0054 JL	<0.005 JL	0.021 JL	7.20E-03	1.10E-02
Benzo(q,h,i)perylene	191-24-2	mg/kg	<0.0039	0.0046 J	0.22	<0.0044	<0.0039	<0.0041	<0.0036	<0.0035	<0.0038	0.0059 J	<0.0043 JL	<0.0044 JL	0.018 JL	4.50E-03	5.70E-03
Benzo(k)fluoranthene	207-08-9	mg/kg	<0.0045	0.0068 J	0.2	<0.005	<0.0044	<0.0047	<0.0041	<0.004	<0.0043	<0.0044	<0.0049 JL	<0.005 JL	0.026 JL	3.50E-03	4.00E-03
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.0033	<0.0033	<0.0034	<0.0037	<0.0032	<0.0034	<0.003	<0.0029	<0.0031	<0.0032	<0.0036 JL	<0.0036 JL	<0.0035 JL	---	---
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.0038	<0.0038	<0.0039	<0.0043	<0.0037	<0.004	<0.0035	<0.0034	<0.0036	<0.0038	<0.0042 JL	<0.0042 JL	<0.004 JL	---	---
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.0037	<0.0037	<0.0038	<0.0041	<0.0036	<0.0038	<0.0034	<0.0033	<0.0035	<0.0036	<0.004 JL	<0.0041 JL	<0.0039 JL	---	---
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	<0.009 U JL	<0.009 U JL	<0.0092 U JL	<0.01	<0.0088	<0.0094	<0.0083	<0.0081	<0.0086	<0.0089	0.013 JL	<0.0099 JL	0.021 JL	---	---
Butyl benzyl phthalate	85-68-7	mg/kg	<0.0034	<0.0034	<0.0035	<0.0038	<0.0033	<0.0036	<0.0031	<0.0031	<0.0032	<0.0034	<0.0037 JL	<0.0038 JL	<0.0036 JL	---	---
Caprolactam	105-60-2	mg/kg	0.013	0.014	<0.0034	<0.0037	<0.0032	<0.0034	<0.003	<0.0029	<0.0031	<0.0032	<0.0036 JL	<0.0036 JL	<0.0035 JL	---	---
Carbazole	86-74-8	mg/kg	<0.003	<0.003	0.072	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	0.0045 JL	---	---
Chrysene	218-01-9	mg/kg	<0.0039	0.014	0.45	<0.0044	<0.0039	<0.0041	<0.0036	<0.0035	<0.0038	0.0074 J	0.0062 JL	<0.0044 JL	0.031 JL	6.90E-03	9.10E-03
Dibenz(a,h)anthracene	53-70-3	mg/kg	<0.003	<0.003	0.062	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	<0.0032 JL	<0.0022	<0.0023
Dibenzofuran	132-64-9	mg/kg	<0.003	<0.003	0.011	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	<0.0032 JL	<0.00098	<0.00099
Diethyl phthalate	84-66-2	mg/kg	<0.0045	<0.0045	<0.0046	<0.005	<0.0044	<0.0047	<0.0041	<0.004	<0.0043	<0.0044	0.0064 JL	<0.005 JL	0.0065 JL	---	---
Dimethyl phthalate	131-11-3	mg/kg	<0.0033	<0.0033	<0.0034	<0.0037	<0.0032	<0.0034	<0.003	<0.0029	<0.0031	<0.0032	<0.0036 JL	<0.0036 JL	<0.0035 JL	---	---
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0034 U JL	<0.0034	<0.0035	<0.0038	<0.0033	<0.0036	<0.0031	<0.0031	<0.0032	<0.0034	0.0071 JL	0.0052 JL	0.0067 JL	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0039	<0.004	<0.0041	<0.0044	<0.0039	<0.0041	<0.0036	<0.0035	<0.0038	<0.0039	<0.0043 JL	<0.0044 JL	<0.0042 JL	---	---
Fluoranthene	206-44-0	mg/kg	0.0044 J	0.012	0.84	0.0055 J	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	0.0099	0.013 JL	0.0055 JL	0.044 JL	9.90E-03	1.80E-02
Fluorene	86-73-7	mg/kg	<0.003	<0.003	0.02	<0.0033	<0.0029	<0.0031	<0.0028	<0.0027	<0.0029	<0.003	<0.0033 JL	<0.0033 JL	<0.0032 JL	<0.0015	<0.0016
Hexachlorobenzene	118-74-1	mg/kg	<0.0035	<0.0035	<0.0036	<0.004	<0.0035	<0.0037	<0.0033	<0.0032	<0.0034	<0.0035	<0.				

Surface Water Data Summary
Up River Road
Brine Service Company Superfund Site

		Sample Location Sample Date		UPSW02 2/1/2012	UPSW04 2/1/2012	UPSW06 1/31/2012	UPSW06 1/31/2012	UPSW07 2/1/2012
Analyte	CAS No.	T/D	Units					
METALS								
Aluminum#	7429-90-5	T	mg/l	0.121	0.695	0.22	0.258	0.106
Antimony	7440-36-0	T	mg/l	0.00104 J	0.00205 J	<0.0008	<0.0008	<0.0008
Arsenic	7440-38-2	T	mg/l	0.00651	0.00898	0.019	0.0198	0.00234 J
Barium	7440-39-3	T	mg/l	0.182	0.107	0.112	0.121	0.134
Beryllium	7440-41-7	T	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Cadmium	7440-43-9	D	mg/l	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	7440-47-3	D	mg/l	0.00176 J	0.00131 J	<0.0012	<0.0012	<0.0012
Cobalt#	7440-48-4	T	mg/l	<0.0008	<0.0008	0.0013 J	0.0014 J	<0.0008
Copper#	7440-50-8	D	mg/l	0.00454 J	0.0126	0.00382 J	0.00299 J	0.00175 J
Lead	7439-92-1	D	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Manganese#	7439-96-5	T	mg/l	0.0503	0.0275	1.34	1.37	0.243
Nickel	7440-02-0	D	mg/l	0.00178 J	0.00332 J	0.00692	0.00655	0.00192 J
Selenium	7782-49-2	T	mg/l	0.00114 J	0.00125 J	0.00113 J	<0.001	<0.001
Silver	7440-22-4	D	mg/l	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Thallium	7440-28-0	T	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	7440-62-2	T	mg/l	0.00822	0.0273	0.00201 J	0.0021 J	0.00362 J
Zinc	7440-66-6	D	mg/l	0.0215	0.00757 U	0.00986	0.00739	0.00697 U
Mercury	7439-97-6	T	mg/l	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005	<4.2e-005
PESTICIDES AND PCBs								
4,4'-DDD	72-54-8	N	mg/l	3.9e-006 J	0.0000047	<2.5e-006 JL	<2.5e-006 JL	3.3e-006 J
4,4'-DDE	72-55-9	N	mg/l	<2.5e-006	<2.5e-006	<2.5e-006 JL	<2.5e-006 JL	<2.5e-006
4,4'-DDT#	50-29-3	N	mg/l	9.4e-006 J	<2.5e-006	<2.5e-006	<2.5e-006	5.80E-06
Aldrin	309-00-2	N	mg/l	0.0000023	<1.2e-006	<1.2e-006 JL	<1.2e-006 JL	0.0000025
alpha-BHC	319-84-6	N	mg/l	2.9e-006 J	1.5e-006 J	7.4e-006 JL	9.2e-006 JL	0.0000027
alpha-Chlordane	5103-71-9	N	mg/l	<2.5e-006 J	<2.5e-006	<2.5e-006 JL	<2.5e-006 JL	<2.5e-006
beta-BHC	319-85-7	N	mg/l	1.3e-006 J	<1.2e-006	5.1e-006 J	7.4e-006 J	<1.2e-006
delta-BHC	319-86-8	N	mg/l	<1.2e-006	0.0000043	<1.2e-006 JL	<1.2e-006 JL	0.0000038
Dieldrin	60-57-1	N	mg/l	<2.5e-006	<2.5e-006	<2.5e-006 JL	<2.5e-006 JL	<2.5e-006
Endosulfan I#	959-98-8	N	mg/l	<1.2e-006	<1.2e-006	<1.2e-006 JL	<1.2e-006 JL	3e-005 J
Endosulfan II	33213-65-9	N	mg/l	<2.5e-006 J	<2.5e-006	<2.5e-006 JL	<2.5e-006 JL	<2.5e-006
Endosulfan sulfate	1031-07-8	N	mg/l	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006	<2.5e-006
Endrin#	72-20-8	N	mg/l	4.2e-006 J	<2.5e-006	<2.5e-006 JL	<2.5e-006 JL	4.40E-06
Endrin aldehyde	7421-93-4	N	mg/l	<2.5e-006 J	<2.5e-006	<2.5e-006 JL	2.7e-006 JL	<2.5e-006
gamma-BHC	58-89-9	N	mg/l	7.8e-006 J	<1.2e-006 J	<1.2e-006	<1.2e-006	<1.2e-006 J
gamma-Chlordane	5103-74-2	N	mg/l	<2.5e-006	<2.5e-006 J	<2.5e-006 JL	<2.5e-006 JL	<2.5e-006
Heptachlor	76-44-8	N	mg/l	<1.2e-006	<1.2e-006	1.3e-006 JL	3.2e-006 JL	2e-006 J
Heptachlor epoxide	1024-57-3	N	mg/l	<1.2e-006	<1.2e-006	<1.2e-006 JL	<1.2e-006 JL	<1.2e-006
Methoxychlor	72-43-5	N	mg/l	<1.2e-005	<1.2e-005	<1.2e-005	<1.2e-005	<1.2e-005
Toxaphene	8001-35-2	N	mg/l	<2.5e-005	<2.5e-005	<2.5e-005	<2.5e-005	<2.5e-005
Aroclor 1016	12674-11-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1221	11104-28-2	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1232	11141-16-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1242	53469-21-9	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1248	12672-29-6	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1254	11097-69-1	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Aroclor 1260	11096-82-5	N	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SEMITOLATILE ORGANIC COMPOUNDS								
1,1'-Biphenyl	92-52-4	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
1-Methylnaphthalene	90-12-0	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
2,4,5-Trichlorophenol	95-95-4	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005	<5e-005
2,4,6-Trichlorophenol	88-06-2	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005
2,4-Dichlorophenol	120-83-2	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005
2,4-Dimethylphenol	105-67-9	N	mg/l	0.00036	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005
2,4-Dinitrophenol	51-28-5	N	mg/l	<8e-005	<8e-005 JL	<8e-005	<8e-005	<8e-005
2,4-Dinitrotoluene	121-14-2	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
2,6-Dinitrotoluene	606-20-2	N	mg/l	<6e-005	<6e-005	<6e-005	<6e-005	<6e-005
2-Chloronaphthalene	91-58-7	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
2-Chlorophenol	95-57-8	N	mg/l	<6e-005	<6e-005 JL	<6e-005 JL	<6e-005 JL	<6e-005
2-Methylnaphthalene	91-57-6	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Surface Water Data Summary
Up River Road
Brine Service Company Superfund Site

Analyte	CAS No.	Sample Location		UPSW02	UPSW04	UPSW06	UPSW06	UPSW07
		Sample Date	T/D	2/1/2012	2/1/2012	1/31/2012	1/31/2012	2/1/2012
2-Methylphenol	95-48-7	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005 JL	9e-005 J
2-Nitroaniline	88-74-4	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
2-Nitrophenol	88-75-5	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005	<5e-005
3&4-Methylphenol	106-44-5	N	mg/l	9.8e-005 J	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005
3,3'-Dichlorobenzidine	91-94-1	N	mg/l	<5e-005	<5e-005	R	R	<5e-005
3-Nitroaniline	99-09-2	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
4,6-Dinitro-2-methylphenol	534-52-1	N	mg/l	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005	<8e-005
4-Bromophenyl phenyl ether	101-55-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
4-Chloro-3-methylphenol	59-50-7	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005
4-Chloroaniline	106-47-8	N	mg/l	<5e-005	<5e-005	R	R	<5e-005
4-Chlorophenyl phenyl ether	7005-72-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
4-Nitroaniline	100-01-6	N	mg/l	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005 JL
4-Nitrophenol	100-02-7	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005	<5e-005
Acenaphthene	83-32-9	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Acenaphthylene	208-96-8	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Acetophenone	98-86-2	N	mg/l	0.0001 J	<0.0001	<0.0001	<0.0001	<0.0001
Anthracene	120-12-7	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Benz(a)anthracene	56-55-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Benzaldehyde	100-52-7	N	mg/l	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005 JL	<5e-005 JL
Benz(a)pyrene	50-32-8	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Benz(b)fluoranthene	205-99-2	N	mg/l	<6e-005	<6e-005	<6e-005	<6e-005	<6e-005
Benz(g,h,i)perylene	191-24-2	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Benz(k)fluoranthene	207-08-9	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Bis(2-chloroethoxy)methane	111-91-1	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Bis(2-chloroethyl)ether	111-44-4	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Bis(2-chloroisopropyl)ether	108-60-1	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
Bis(2-ethylhexyl)phthalate	117-81-7	N	mg/l	0.00015 J	<0.0001	0.0001 J	0.00046	<0.0001
Butyl benzyl phthalate	85-68-7	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Caprolactam	105-60-2	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
Carbazole	86-74-8	N	mg/l	7.4e-005 J	<5e-005	<5e-005	<5e-005	<5e-005
Chrysene	218-01-9	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Dibenz(a,h)anthracene	53-70-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Dibenzofuran	132-64-9	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Diethyl phthalate	84-66-2	N	mg/l	<5e-005	<5e-005	7.1e-005 J	6.1e-005 J	<5e-005
Dimethyl phthalate	131-11-3	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
Di-n-butyl phthalate	84-74-2	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Di-n-octyl phthalate	117-84-0	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Fluoranthene	206-44-0	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Fluorene	86-73-7	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Hexachlorobenzene	118-74-1	N	mg/l	<6e-005	<6e-005	<6e-005	<6e-005	<6e-005
Hexachlorobutadiene	87-68-3	N	mg/l	<6e-005	<6e-005	<6e-005	<6e-005	<6e-005
Hexachlorocyclopentadiene	77-47-4	N	mg/l	<6e-005	<6e-005	<6e-005	<6e-005	<6e-005
Hexachloroethane	67-72-1	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Indeno(1,2,3-cd)pyrene	193-39-5	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Isophorone	78-59-1	N	mg/l	<5e-005	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005
Naphthalene	91-20-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Nitrobenzene	98-95-3	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
N-Nitrosodi-n-propylamine	621-64-7	N	mg/l	<8e-005	<8e-005	<8e-005 JL	<8e-005 JL	<8e-005
N-Nitrosodiphenylamine	86-30-6	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Pentachlorophenol	87-86-5	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005	<5e-005
Phenanthrene	85-01-8	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Phenol	108-95-2	N	mg/l	<5e-005	<5e-005 JL	<5e-005 JL	<5e-005 JL	6.5e-005 J
Pyrene	129-00-0	N	mg/l	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Total PAHs	TPAH	N	mg/l	<0.000455	<0.000455	<0.000455	<0.000455	<0.000455

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< - Analyte not detected above the SDL

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--- Not Analyzed

Sediment Analytical Data Summary
Up River Road
Brine Service Company Superfund Site

Analyte	Sample Location	Depth Interval	UPSD01	UPSD02	UPSD03	UPSD04	UPSD04	UPSD05	UPSD06	UPSD06	UPSD07
	CAS No.		Sample Date	0-0.5 ft							
METALS											
Aluminum	7429-90-5	mg/kg	3.88E+03	5.91E+03	1.02E+04	3.81E+03	4.76E+03	3.01E+03	6.02E+03	3.77E+03	3.00E+03
Antimony	7440-36-0	mg/kg	<0.28	<0.28	4.20E-01	<0.26	<0.25	<0.23	<0.46	<0.34	<0.27
Arsenic	7440-38-2	mg/kg	1.71E+00	2.40E+00	5.86E+00	2.04E+00	1.68E+00	1.70E+00	2.47E+01	2.11E+01	1.15E+00
Barium	7440-39-3	mg/kg	2.72E+02	2.15E+02	7.81E+02	3.58E+02	4.18E+02	2.63E+02	8.34E+02	5.84E+02	1.11E+02
Beryllium	7440-41-7	mg/kg	2.60E-01	3.99E-01	3.57E-01	2.31E-01	2.34E-01	2.08E-01	3.94E-01	2.77E-01	1.96E-01
Cadmium	7440-43-9	mg/kg	2.86E-01	4.01E-01	3.47E-01	3.78E-01	2.92E-01	1.65E-01	9.07E-01	5.99E-01	9.02E-02
Chromium	7440-47-3	mg/kg	3.42E+00	2.43E+01	1.02E+02	8.71E+00	7.71E+00	3.35E+00	1.19E+01	8.65E+00	2.71E+00
Cobalt	7440-48-4	mg/kg	1.72E+00	2.19E+00	1.27E+01	1.91E+00	1.99E+00	1.44E+00	7.36E+00	4.57E+00	1.34E+00
Copper	7440-50-8	mg/kg	4.22E+00	7.28E+00	2.55E+01	1.94E+01	6.85E+00	5.89E+00	3.00E+01	3.49E+01	3.00E+00
Lead	7439-92-1	mg/kg	9.81E+00	2.33E+01	3.07E+01	2.25E+01	1.60E+01	2.08E+01	6.80E+01	5.44E+01	4.81E+00
Manganese	7439-96-5	mg/kg	1.12E+02	1.41E+02	6.54E+03	3.14E+02	2.77E+02	1.07E+02	2.10E+03	1.58E+03	4.93E+01
Nickel	7440-02-0	mg/kg	2.93E+00	6.10E+00	2.66E+01	4.33E+00	4.17E+00	2.54E+00	6.80E+00	4.93E+00	2.02E+00
Selenium	7782-49-2	mg/kg	5.90E-01	9.50E-01	7.67E-01	7.85E-01	4.74E-01	4.26E-01	4.82E-01	6.15E-01	3.29E-01
Silver	7440-22-4	mg/kg	<0.11	<0.11	<0.11	<0.1	<0.1	<0.091	<0.089	<0.08	<0.12
Thallium	7440-28-0	mg/kg	<0.097	<0.097	<0.099	<0.091	<0.089	<0.08	<0.16	<0.12	<0.093
Vanadium	7440-62-2	mg/kg	6.81E+00	9.72E+00	2.52E+01	1.02E+01	1.03E+01	6.12E+00	1.64E+01	1.24E+01	6.01E+00
Zinc	7440-66-6	mg/kg	4.06E+01	7.73E+01	1.46E+02	7.39E+01	6.54E+01	3.60E+01	1.62E+02	1.27E+02	1.96E+01
Mercury	7439-97-6	mg/kg	1.95E-02	1.16E-01	3.83E-02	3.98E-02	4.00E-02	1.02E-02	1.10E-01	6.17E-02	6.91E-03
Cyanide	57-12-5	mg/kg	---	---	---	---	---	---	---	---	---
PESTICIDES AND PCBs											
4,4'-DDD	72-54-8	mg/kg	<0.0073	<0.0074	<0.0073	<0.0069	<0.007	<0.0062	<0.026	<0.0099	<0.0074
4,4'-DDE	72-55-9	mg/kg	<0.0073	<0.0074	<0.0073	<0.0069	<0.007	<0.0062	<0.026	<0.0099	<0.0074
4,4'-DDT	50-29-3	mg/kg	<0.0073	<0.0074	<0.0073	<0.0069	<0.007	<0.0062	<0.026	<0.0099	<0.0074
Aldrin	309-00-2	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	<0.0059	<0.0044
alpha-BHC	319-84-6	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	2.20E-02	<0.0044
alpha-Chlordane	5103-71-9	mg/kg	<0.0029	<0.003	<0.0029	<0.0028	<0.0028	<0.0025	<0.011	<0.004	<0.003
beta-BHC	319-85-7	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	<0.0059	<0.0044
delta-BHC	319-86-8	mg/kg	<0.0029	<0.003	<0.0029	<0.0028	<0.0028	<0.0025	<0.011	<0.004	<0.003
Dieldrin	60-57-1	mg/kg	<0.0073	<0.0074	<0.0073	<0.0069	<0.007	<0.0062	<0.026	<0.0099	<0.0074
Endosulfan I	959-98-8	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	<0.0059	<0.0044
Endosulfan II	33213-65-9	mg/kg	<0.0087	<0.0089	<0.0088	<0.0083	<0.0084	<0.0075	<0.032	<0.012	<0.0089
Endosulfan sulfate	1031-07-8	mg/kg	<0.0087	2.80E-02	<0.0088	<0.0083	<0.0084	<0.0075	<0.032	<0.012	<0.0089
Endrin	72-20-8	mg/kg	<0.0087	<0.0089	<0.0088	<0.0083	<0.0084	<0.0075	<0.032	<0.012	<0.0089
Endrin aldehyde	7421-93-4	mg/kg	<0.0087	<0.0089	<0.0088	<0.0083	<0.0084	<0.0075	<0.032	<0.012	<0.0089
gamma-BHC	58-89-9	mg/kg	<0.0029	<0.003	<0.0029	<0.0028	<0.0028	<0.0025	<0.011	<0.004	<0.003
gamma-Chlordane	5103-74-2	mg/kg	<0.0029	<0.003	<0.0029	<0.0028	<0.0028	<0.0025	<0.011	<0.004	<0.003
Heptachlor	76-44-8	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	<0.0059	<0.0044
Heptachlor epoxide	1024-57-3	mg/kg	<0.0044	<0.0045	<0.0044	<0.0042	<0.0042	<0.0037	<0.016	<0.0059	<0.0044
Methoxychlor	72-43-5	mg/kg	<0.049	<0.051	<0.05	<0.047	<0.048	<0.042	<0.18	<0.067	<0.05
Toxaphene	8001-35-2	mg/kg	<0.07	<0.071	<0.07	<0.067	<0.067	<0.06	<0.25	<0.095	<0.071
Aroclor 1016	12674-11-2	mg/kg	<0.0035	<0.0036	<0.0035	<0.0033	<0.0034	<0.003	<0.063	<0.047	<0.0035
Aroclor 1221	11104-28-2	mg/kg	<0.0035	<0.0036	<0.0035	<0.0033	<0.0034	<0.003	<0.063	<0.047	<0.0035
Aroclor 1232	11141-16-5	mg/kg	<0.0035	<0.0036	<0.0035	<0.0033	<0.0034	<0.003	<0.063	<0.047	<0.0035
Aroclor 1242	53469-21-9	mg/kg	<0.0035	<0.0036	<0.0035	<0.					

Sediment Analytical Data Summary
Up River Road
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date	UPSD01	UPSD02	UPSD03	UPSD04	UPSD04	UPSD05	UPSD06	UPSD06	UPSD07
		0-0.5 ft 2/1/2012	0-0.5 ft 1/31/2012	0-0.5 ft 1/31/2012	0-0.5 ft 2/1/2012					
Bromodichloromethane	75-27-4 mg/kg	---	---	---	---	---	---	---	---	---
Bromoform	75-25-2 mg/kg	---	---	---	---	---	---	---	---	---
Bromomethane	74-83-9 mg/kg	---	---	---	---	---	---	---	---	---
Carbon disulfide	75-15-0 mg/kg	---	---	---	---	---	---	---	---	---
Carbon tetrachloride	56-23-5 mg/kg	---	---	---	---	---	---	---	---	---
Chlorobenzene	108-90-7 mg/kg	---	---	---	---	---	---	---	---	---
Chloroethane	75-00-3 mg/kg	---	---	---	---	---	---	---	---	---
Chloroform	67-66-3 mg/kg	---	---	---	---	---	---	---	---	---
Chloromethane	74-87-3 mg/kg	---	---	---	---	---	---	---	---	---
cis-1,2-Dichloroethene	156-59-2 mg/kg	---	---	---	---	---	---	---	---	---
cis-1,3-Dichloropropene	10061-01-5 mg/kg	---	---	---	---	---	---	---	---	---
Cyclohexane	110-82-7 mg/kg	---	---	---	---	---	---	---	---	---
Dibromochloromethane	124-48-1 mg/kg	---	---	---	---	---	---	---	---	---
Dichlorodifluoromethane	75-71-8 mg/kg	---	---	---	---	---	---	---	---	---
Ethylbenzene	100-41-4 mg/kg	---	---	---	---	---	---	---	---	---
Isopropylbenzene	98-82-8 mg/kg	---	---	---	---	---	---	---	---	---
Methyl acetate	79-20-9 mg/kg	---	---	---	---	---	---	---	---	---
Methyl tert-butyl ether	1634-04-4 mg/kg	---	---	---	---	---	---	---	---	---
Methylcyclohexane	108-87-2 mg/kg	---	---	---	---	---	---	---	---	---
Methylene chloride	75-09-2 mg/kg	---	---	---	---	---	---	---	---	---
Naphthalene	91-20-3 mg/kg	---	---	---	---	---	---	---	---	---
n-Butylbenzene	104-51-8 mg/kg	---	---	---	---	---	---	---	---	---
n-Propylbenzene	103-65-1 mg/kg	---	---	---	---	---	---	---	---	---
sec-Butylbenzene	135-98-8 mg/kg	---	---	---	---	---	---	---	---	---
Styrene	100-42-5 mg/kg	---	---	---	---	---	---	---	---	---
tert-Butylbenzene	98-06-6 mg/kg	---	---	---	---	---	---	---	---	---
Tetrachloroethene	127-18-4 mg/kg	---	---	---	---	---	---	---	---	---
Toluene	108-88-3 mg/kg	---	---	---	---	---	---	---	---	---
trans-1,2-Dichloroethene	156-60-5 mg/kg	---	---	---	---	---	---	---	---	---
trans-1,3-Dichloropropene	10061-02-6 mg/kg	---	---	---	---	---	---	---	---	---
Trichloroethene	79-01-6 mg/kg	---	---	---	---	---	---	---	---	---
Trichlorofluoromethane	75-69-4 mg/kg	---	---	---	---	---	---	---	---	---
Vinyl chloride	75-01-4 mg/kg	---	---	---	---	---	---	---	---	---
Xylenes, Total	1330-20-7 mg/kg	---	---	---	---	---	---	---	---	---
SVOCs										
1,1'-Biphenyl	92-52-4 mg/kg	<0.019	1.30E-01	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
1-Methylnaphthalene	90-12-0 mg/kg	<0.019	3.70E-01	2.30E-02	<0.018	<0.018	<0.016	4.80E-02	<0.025	<0.019
2,4,5-Trichlorophenol	95-95-4 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2,4,6-Trichlorophenol	88-06-2 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2,4-Dichlorophenol	120-83-2 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2,4-Dimethylphenol	105-67-9 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2,4-Dinitrophenol	51-28-5 mg/kg	<0.038	<0.098	<0.039	<0.037	<0.037	<0.033	<0.069	<0.052	<0.039
2,4-Dinitrotoluene	121-14-2 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	2.00E-02
2,6-Dinitrotoluene	606-20-2 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	2.50E-02
2-Chloronaphthalene	91-58-7 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2-Chlorophenol	95-57-8 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2-Methylnaphthalene	91-57-6 mg/kg	2.00E-02	6.50E-01	2.50E-02	4.50E-02	6.80E-02	1.80E-02	8.60E-02	3.40E-02	<0.019
2-Methylphenol	95-48-7 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
2-Nitroaniline	88-74-4 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	6.50E-02
2-Nitrophenol	88-75-5 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
3&4-Methylphenol	106-44-5 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	6.40E-02	<0.025	<0.019
3,3'-Dichlorobenzidine	91-94-1 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	2.30E-02
3-Nitroaniline	99-09-2 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4,6-Dinitro-2-methylphenol	534-52-1 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	7.40E-02
4-Bromophenyl phenyl ether	101-55-3 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4-Chloro-3-methylphenol	59-50-7 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4-Chloroaniline	106-47-8 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4-Chlorophenyl phenyl ether	7005-72-3 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4-Nitroaniline	100-01-6 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
4-Nitrophenol	100-02-7 mg/kg	<0.038	<0.098	<0.039	<0.037	<0.037	<0.033	<0.069	<0.052	8.80E-02
Acenaphthene	83-32-9 mg/kg	<0.019	3.10E+00	<0.019	<0.018	<0.018	<0.016	9.20E-02	<0.025	<0.019
Acenaphthylene	208-96-8 mg/kg	<0.019	<0.048	<0.019	<0.018	<0.018	<0.016	<0.034	<0.025	<0.019
Acetophenone	98-86-2 mg/kg	2.00E-02	<0.048	<0.019	<0.018	<0.018	<0.016	4.90E-02	<0.025	<0.019
Anthracene	120-12-7 mg/kg	<0.019	6.10E+00	2.30E-02	<0.018	<0.018	<0.016	2.30E-01	2.90E-02	5.60E-

Sediment Analytical Data Summary
Up River Road
Brine Service Company Superfund Site

Analyte	CAS No.	Units	Sample Location		UPSD01 0-0.5 ft		UPSD02 0-0.5 ft		UPSD03 0-0.5 ft		UPSD04 0-0.5 ft		UPSD05 0-0.5 ft		UPSD06 0-0.5 ft		UPSD07 0-0.5 ft	
			Depth Interval	Sample Date	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	2/1/2012	1/31/2012	1/31/2012	2/1/2012	
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	2.00E-02
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	<0.019		<0.048	9.20E-02		<0.018		<0.018		5.90E-02	3.70E-01	1.70E-01	2.90E-02			
Butyl benzyl phthalate	85-68-7	mg/kg	<0.033		<0.083	3.70E-02		<0.031		<0.031		<0.028		<0.059		<0.044		<0.033
Caprolactam	105-60-2	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	2.50E-02
Carbazole	86-74-8	mg/kg	<0.019		4.50E+00	2.40E-02		<0.018		<0.018		<0.016		1.30E-01		<0.025		<0.019
Chrysene	218-01-9	mg/kg	4.40E-02	1.90E+01		1.50E-01	1.20E-01	1.10E-01	4.00E-02	4.60E-01	6.40E-02	5.30E-02						
Dibenz(a,h)anthracene	53-70-3	mg/kg	<0.023		2.30E+00	2.40E-02		<0.022		<0.022		<0.02		<0.042		4.40E-02	3.90E-02	
Dibenzofuran	132-64-9	mg/kg	<0.019		1.60E+00		<0.019		<0.018		<0.018		<0.016		4.50E-02		<0.025	<0.019
Diethyl phthalate	84-66-2	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Dimethyl phthalate	131-11-3	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	<0.024
Di-n-butyl phthalate	84-74-2	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		2.10E-02		<0.042		<0.032	<0.024
Di-n-octyl phthalate	117-84-0	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	1.60E-01
Fluoranthene	206-44-0	mg/kg	4.30E-02	3.30E+01	2.50E-01	2.00E-01	2.10E-01	6.10E-02	1.10E+00	1.80E-01	1.40E-01							
Fluorene	86-73-7	mg/kg	<0.019		2.40E+00	<0.019	<0.018		<0.018		<0.016		7.40E-02		<0.025		<0.019	
Hexachlorobenzene	118-74-1	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Hexachlorobutadiene	87-68-3	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Hexachloroethane	67-72-1	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	<0.019		9.70E+00	1.20E-01	1.00E-01	6.40E-02	3.00E-02	3.90E-01	6.10E-02	6.50E-01						
Isophorone	78-59-1	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
Naphthalene	91-20-3	mg/kg	<0.019		2.40E+00		<0.019		<0.018		2.40E-02		<0.016	8.80E-02	2.70E-02		<0.019	
Nitrobenzene	98-95-3	mg/kg	<0.019		<0.048		<0.019		<0.018		<0.018		<0.016		<0.034		<0.025	<0.019
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	9.40E-02
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	<0.024
Pentachlorophenol	87-86-5	mg/kg	<0.021		<0.054		<0.021		<0.02		<0.02		<0.018		<0.038		<0.028	<0.021
Phenanthrene	85-01-8	mg/kg	5.40E-02	2.40E+01	1.00E-01	8.70E-02	7.70E-02	3.70E-02	6.50E-01	8.20E-02	5.60E-02							
Phenol	108-95-2	mg/kg	<0.023		<0.059		<0.024		<0.022		<0.022		<0.02		<0.042		<0.032	<0.024
Pyrene	129-00-0	mg/kg	5.00E-02	2.40E+01	1.70E-01	1.70E-01	1.40E-01	4.70E-02	7.20E-01	1.20E-01	8.60E-02							
Low Molecular Weight PAHs	LPAH	mg/kg	0.202	110	0.854	0.711	0.654	0.23	3.18	0.538	1.18							
High Molecular Weight PAHs	HPAH	mg/kg	0.122	38.7	0.186	0.177	0.205	0.095	1.24	0.210	0.160							
Total PAHs	TPAH	mg/kg	0.372	195	1.53	1.30	1.22	0.479	6.10	1.05	4.45							
			UPSD01	UPSD02	UPSD03	UPSD04	UPSD04	UPSD05	UPSD06	UPSD06	UPSD07							

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not analyzed

Sediment Analytical Data Summary - East Ditch South
Post Remedial Action
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date		EDSSD04 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD06 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft
	CAS No.	Units	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	10/25/2017	10/25/2017	10/25/2017
METALS										
Aluminum	7429-90-5	mg/kg	9130	4870	11200	8750	9920	18800	21900	20400
Antimony	7440-36-0	mg/kg	<0.32	<0.32	<0.36	<0.33	<0.35	<0.304	<0.307	<0.260
Arsenic	7440-38-2	mg/kg	2.42	2.26	2.94	2.54	2.87	6.45	6.81	3.65
Barium	7440-39-3	mg/kg	1250	264	395	586	674	1180	1350	343
Beryllium	7440-41-7	mg/kg	0.332 J	0.219 J	0.614 J	0.477 J	0.568 J	0.852	0.952	0.86
Cadmium	7440-43-9	mg/kg	0.333 J	0.0966 J	0.312 J	0.327 J	0.394 J	0.553	0.649	0.694
Chromium	7440-47-3	mg/kg	5.61	3.14	6.78	5.69	9.41	18.7	20.6	17.6
Cobalt	7440-48-4	mg/kg	3.96	2.89	4.55	5.12	3.9	5.97	6.68	6.2
Copper	7440-50-8	mg/kg	7.49	3.28	7.8	6.37	12.5	27.4	32.9	17
Lead	7439-92-1	mg/kg	18	6.41	11.2	14	77	46.4	58.5	27.2
Manganese	7439-96-5	mg/kg	314	252	253	379	280	270	336	237
Nickel	7440-02-0	mg/kg	5.69	2.98	6.93	5.44	6.47	13.1	13.9	11.5
Selenium	7782-49-2	mg/kg	0.501 J	<0.32	0.59 J	0.571 J	0.641 J	0.609	0.935	0.535
Silver	7440-22-4	mg/kg	<0.052	<0.051	0.13 J	0.161 J	0.13 J	<0.121	<0.123	<0.104
Thallium	7440-28-0	mg/kg	<0.091	<0.089	0.217 J	0.234 J	0.288 J	0.233	0.266	0.25
Vanadium	7440-62-2	mg/kg	13.4	10.2	14.3	13.8	14.2	29.9	31.9	31.3
Zinc	7440-66-6	mg/kg	48.3	15.6	33.9	32.8	78.9	178	179	111
Mercury	7439-97-6	mg/kg	0.0225	0.0056	0.0143	0.0128	0.0184	0.0487	0.04	0.032
Cyanide	57-12-5	mg/kg	<0.84	<0.79	<0.94	<0.88	0.99 J	---	---	---
PESTICIDES AND PCBs										
4,4'-DDD	72-54-8	mg/kg	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---
4,4'-DDE	72-55-9	mg/kg	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---
4,4'-DDT	50-29-3	mg/kg	0.024 JH	<0.0033	<0.004	<0.0037	<0.0039	---	---	---
Aldrin	309-00-2	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
alpha-BHC	319-84-6	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
alpha-Chlordane	5103-71-9	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
beta-BHC	319-85-7	mg/kg	0.04 JH	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
delta-BHC	319-86-8	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
Dieldrin	60-57-1	mg/kg	<0.0035	<0.0033	<0.004	<0.0037	<0.0039	---	---	---
Endosulfan I	959-98-8	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
Endosulfan II	33213-65-9	mg/kg	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---
Endosulfan sulfate	1031-07-8	mg/kg	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---
Endrin	72-20-8	mg/kg	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---
Endrin aldehyde	7421-93-4	mg/kg	<0.0042	<0.004	<0.0047	<0.0044	<0.0046	---	---	---
gamma-BHC	58-89-9	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
gamma-Chlordane	5103-74-2	mg/kg	0.028	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
Heptachlor	76-44-8	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
Heptachlor epoxide	1024-57-3	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	<0.0023	---	---	---
Methoxychlor	72-43-5	mg/kg	<0.024	<0.022	<0.027	<0.025	<0.026	---	---	---
Toxaphene	8001-35-2	mg/kg	<0.027	<0.025	<0.03	<0.028	<0.029	---	---	---
Aroclor 1016	12674-11-2	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1221	11104-28-2	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1232	11141-16-5	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1242	53469-21-9	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1248	12672-29-6	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1254	11097-69-1	mg/kg	<0.0034	<0.0032	<0.0038	<0.0036	<0.0037	---	---	---
Aroclor 1260	11096-82-5	mg/kg	<0.0025	<0.0024	<0.0028	<0.0027	<0.0028	---	---	---
Total PCBs	N/A	mg/kg	All ND	---	---	---				
VOCs										
1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
1,1,1-Trichloroethane	71-55-6	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
1,1,2-Trichloroethane	79-00-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
1,1-Dichloroethane	75-34-3	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---

Sediment Analytical Data Summary - East Ditch South
Post Remedial Action
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date		EDSSD04 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD06 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft
	CAS No.	Units	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	10/25/2017	10/25/2017	10/25/2017
Carbon tetrachloride	56-23-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Chlorobenzene	108-90-7	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Chloroethane	75-00-3	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
Chloroform	67-66-3	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Chloromethane	74-87-3	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Cyclohexane	110-82-7	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Dibromochloromethane	124-48-1	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Dichlorodifluoromethane	75-71-8	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Ethylbenzene	100-41-4	mg/kg	0.0036 J	<0.00066	<0.00079	<0.00074	0.0038 J	< 0.0012	< 0.0011	< 0.00075
Isopropylbenzene	98-82-8	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Methyl acetate	79-20-9	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Methylcyclohexane	108-87-2	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Methylene chloride	75-09-2	mg/kg	<0.0014	<0.0013	<0.0016	<0.0015	<0.0015	---	---	---
Naphthalene	91-20-3	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
n-Butylbenzene	104-51-8	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	0.0036 J	---	---	---
n-Propylbenzene	103-65-1	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	0.0036 J	---	---	---
sec-Butylbenzene	135-98-8	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Styrene	100-42-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
tert-Butylbenzene	98-06-6	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Tetrachloroethene	127-18-4	mg/kg	<0.00085	<0.00088	<0.00095	<0.00089	<0.00093	---	---	---
Toluene	108-88-3	mg/kg	0.0049 J	<0.00066	<0.00079	<0.00074	<0.00077	< 0.0011	< 0.00096	< 0.00064
trans-1,2-Dichloroethene	156-60-5	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
trans-1,3-Dichloropropene	10061-02-6	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Trichloroethene	79-01-6	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Trichlorofluoromethane	75-69-4	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Vinyl chloride	75-01-4	mg/kg	<0.00071	<0.00066	<0.00079	<0.00074	<0.00077	---	---	---
Xylenes, Total	1330-20-7	mg/kg	<0.0021	<0.002	<0.0024	<0.0022	0.012 J	< 0.0018	< 0.0016	< 0.0011
SVOCs										
1,1'-Biphenyl	92-52-4	mg/kg	<0.0041	<0.0038 JL	<0.0046 JL	<0.0043 JL	<0.0045 JL	---	---	---
1-Methylnaphthalene	90-12-0	mg/kg	<0.0032	<0.003 JL	<0.0036 JL	<0.0034 JL	<0.0036 JL	< 0.0024	< 0.0024	< 0.0021
2,4,5-Trichlorophenol	95-95-4	mg/kg	<0.004	<0.0037 JL	<0.0044 JL	<0.0041 JL	<0.0043 JL	---	---	---
2,4,6-Trichlorophenol	88-06-2	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
2,4-Dichlorophenol	120-83-2	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	---	---	---
2,4-Dimethylphenol	105-67-9	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
2,4-Dinitrophenol	51-28-5	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
2,4-Dinitrotoluene	121-14-2	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
2,6-Dinitrotoluene	606-20-2	mg/kg	<0.0045	<0.0042 JL	<0.0051 JL	<0.0047 JL	<0.0049 JL	---	---	---
2-Chloronaphthalene	91-58-7	mg/kg	<0.0058	<0.0054 JL	<0.0065 JL	<0.0061 JL	<0.0063 JL	---	---	---
2-Chlorophenol	95-57-8	mg/kg	<0.0045	<0.0042 JL	<0.0051 JL	<0.0047 JL	<0.0049 JL	---	---	---
2-Methylnaphthalene	91-57-6	mg/kg	<0.0038	<0.0036 JL	<0.0043 JL	<0.0041 JL	<0.0042 JL	< 0.0008	< 0.00081	< 0.00070
2-Methylphenol	95-48-7	mg/kg	<0.0041	<0.0038 JL	<0.0046 JL	<0.0043 JL	<0.0045 JL	---	---	---
2-Nitroaniline	88-74-4	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
2-Nitrophenol	88-75-5	mg/kg	<0.0065	<0.0061 JL	<0.0073 JL	<0.0068 JL	<0.0071 JL	---	---	---
3&4-Methylphenol	106-44-5	mg/kg	0.022	<0.0037 JL	0.016 JL	<0.0041 JL	<0.0043 JL	---	---	---
3,3'-Dichlorobenzidine	91-94-1	mg/kg	<0.0044	<0.0041 JL	<0.0049 JL	<0.0046 JL	<0.0048 JL	---	---	---
3-Nitroaniline	99-09-2	mg/kg	<0.0037	<0.0034 JL	<0.0041 JL	<0.0039 JL	<0.004 JL	---	---	---
4,6-Dinitro-2-methylphenol	534-52-1	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
4-Bromophenyl phenyl ether	101-55-3	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
4-Chloro-3-methylphenol	59-50-7	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
4-Chloroaniline	106-47-8	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	---	---	---
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	---	---	---
4-Nitroaniline	100-01-6	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
4-Nitrophenoxyphenyl ether	100-02-7	mg/kg	<0.0054	<0.005 JL</						

Sediment Analytical Data Summary - East Ditch South
Post Remedial Action
Brine Service Company Superfund Site

Analyte	Sample Location Depth Interval Sample Date		EDSSD04 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD06 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft	EDSSD05 0-0.5 ft	EDSSD07 0-0.5 ft	EDSSD08 0-0.5 ft
	CAS No.	Units	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	10/25/2017	10/25/2017	10/25/2017
Dibenzofuran	132-64-9	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	< 0.0011	< 0.0011	< 0.00098
Diethyl phthalate	84-66-2	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
Dimethyl phthalate	131-11-3	mg/kg	<0.0034	<0.0032 JL	<0.0038 JL	<0.0036 JL	<0.0037 JL	---	---	---
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0035	<0.0033 JL	<0.004 JL	<0.0037 JL	<0.0039 JL	---	---	---
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0041	<0.0038 JL	<0.0046 JL	<0.0043 JL	<0.0045 JL	---	---	---
Fluoranthene	206-44-0	mg/kg	0.026	0.0048 JL	0.036 JL	0.013 JL	0.038 JL	0.011	0.007	0.0099
Fluorene	86-73-7	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	< 0.0018	< 0.0018	< 0.0015
Hexachlorobenzene	118-74-1	mg/kg	<0.0037	<0.0034 JL	<0.0041 JL	<0.0039 JL	<0.004 JL	---	---	---
Hexachlorobutadiene	87-68-3	mg/kg	<0.0062	<0.0058 JL	<0.007 JL	<0.0065 JL	<0.0068 JL	---	---	---
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0051	<0.0048 JL	<0.0057 JL	<0.0053 JL	<0.0056 JL	---	---	---
Hexachloroethane	67-72-1	mg/kg	<0.0055	<0.0051 JL	<0.0062 JL	<0.0058 JL	<0.006 JL	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.013	<0.0046 JL	0.011 JL	0.0055 JL	0.018 JL	0.0044	0.0021	0.0043
Isophorone	78-59-1	mg/kg	<0.0042	<0.004 JL	<0.0047 JL	<0.0044 JL	<0.0046 JL	---	---	---
Naphthalene	91-20-3	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	< 0.0096	< 0.0097	< 0.0084
Nitrobenzene	98-95-3	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0056	<0.0053 JL	<0.0063 JL	<0.0059 JL	<0.0062 JL	---	---	---
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0031	<0.0029 JL	<0.0035 JL	<0.0033 JL	<0.0034 JL	---	---	---
Pentachlorophenol	87-86-5	mg/kg	<0.004 JL	<0.0037 JL	<0.0044 JL	<0.0041 JL	<0.0043 JL	---	---	---
Phenanthrene	85-01-8	mg/kg	0.015	<0.004 JL	0.013 JL	0.0053 JL	0.018 JL	0.0056	0.0034	0.0042
Phenol	108-95-2	mg/kg	<0.0047	<0.0044 JL	<0.0052 JL	<0.0049 JL	<0.0051 JL	---	---	---
Pyrene	129-00-0	mg/kg	0.026	0.0037 JL	0.027 JL	0.01 JL	0.036 JL	0.010	0.0069	0.0093
Low Molecular Weight PAHs	LPAH	mg/kg	0.0359	0.0236	0.0365	0.0274	0.0409	---	---	---
High Molecular Weight PAHs	HPAH	mg/kg	0.116	0.0219	0.1105	0.0469	0.1421	---	---	---
Total PAHs	TPAH	mg/kg	0.2361	0.0657	0.2032	0.1021	0.2756	0.0693	0.0446	0.06159
			EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDSSD05	EDSSD07	EDSSD08

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - East Ditch Riparian Soil Post Response Action
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			ESSB10 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units					
METALS							
Aluminum#	7429-90-5	mg/kg	7280	4890	7800	6720	9390
Antimony	7440-36-0	mg/kg	<0.2	<0.25	<0.21	<0.22	<0.22
Arsenic	7440-38-2	mg/kg	2.85	2.35	2.54	2.75	2.83
Barium#	7440-39-3	mg/kg	203	156	224	1310	161
Beryllium	7440-41-7	mg/kg	0.522	0.272 J	0.563	0.453 J	0.679
Cadmium#	7440-43-9	mg/kg	0.192 J	0.126 J	0.147 J	0.311 J	0.166 J
Chromium#	7440-47-3	mg/kg	5.01	3.03	5.86	5.83	6.01
Cobalt	7440-48-4	mg/kg	3.98	2.24	3.48	3.26	4.63
Copper#	7440-50-8	mg/kg	6.01	2.91	6.04	13.7	5.92
Lead#	7439-92-1	mg/kg	10.4	5.14	9.33	84.8	8.73
Manganese#	7439-96-5	mg/kg	220	121	120	156	297
Nickel#	7440-02-0	mg/kg	5.51	3.15	5.31	5.55	6.54
Selenium#	7782-49-2	mg/kg	1.09	<0.25	1.19	0.998	1.32
Silver	7440-22-4	mg/kg	<0.081	<0.041	<0.083	<0.086	<0.087
Thallium	7440-28-0	mg/kg	0.105 U	0.174 J	0.188 U	0.158 U	0.161 U
Vanadium	7440-62-2	mg/kg	13.4	9.89	9.62	11.7	13.8
Zinc#	7440-66-6	mg/kg	23.9	12.8	18.3	72.9	18.1
Mercury#	7439-97-6	mg/kg	0.0115	0.00602	0.0124	0.0174	0.0244
Cyanide#	57-12-5	mg/kg	<0.7	<0.65	4.55	1.03 J	1.2 J
PESTICIDES and PCBs							
4,4'-DDD	72-54-8	mg/kg	<0.00058	<0.00056	<0.00058	<0.00057	<0.0006
4,4'-DDE	72-55-9	mg/kg	<0.00058	<0.00056	<0.00058	<0.00057	<0.0006
4,4'-DDT#	50-29-3	mg/kg	<0.00058	<0.00056	<0.00058	<0.00057	<0.0006
Aldrin	309-00-2	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
alpha-BHC	319-84-6	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
alpha-Chlordane	5103-71-9	mg/kg	<0.00023	<0.00022	<0.00023	<0.00023	<0.00024
beta-BHC	319-85-7	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
delta-BHC	319-86-8	mg/kg	<0.00023	<0.00022	<0.00023	<0.00023	<0.00024
Dieldrin	60-57-1	mg/kg	<0.00058	<0.00056	<0.00058	<0.00057	<0.0006
Endosulfan I	959-98-8	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
Endosulfan II	33213-65-9	mg/kg	<0.0007	<0.00067	<0.00069	<0.00069	<0.00072
Endosulfan sulfate	1031-07-8	mg/kg	<0.0007	<0.00067	<0.00069	<0.00069	<0.00072
Endrin	72-20-8	mg/kg	<0.0007	<0.00067	<0.00069	<0.00069	<0.00072
Endrin aldehyde	7421-93-4	mg/kg	<0.0007	<0.00067	<0.00069	<0.00069	<0.00072
gamma-BHC	58-89-9	mg/kg	<0.00023	<0.00022	<0.00023	<0.00023	<0.00024
gamma-Chlordane	5103-74-2	mg/kg	<0.00023	<0.00022	<0.00023	<0.00023	<0.00024
Heptachlor	76-44-8	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
Heptachlor epoxide	1024-57-3	mg/kg	<0.00035	<0.00033	<0.00035	<0.00034	<0.00036
Methoxychlor	72-43-5	mg/kg	<0.0039	<0.0038	<0.0039	<0.0039	<0.0041
Toxaphene	8001-35-2	mg/kg	<0.0056	<0.0042	<0.0055	<0.0055	<0.0058
Aroclor 1016	12674-11-2	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1221	11104-28-2	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1232	11141-16-5	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1242	53469-21-9	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1248	12672-29-6	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1254	11097-69-1	mg/kg	<0.0028	<0.0027	<0.0028	<0.0027	<0.0029
Aroclor 1260	11096-82-5	mg/kg	<0.0021	<0.002	<0.0021	<0.0021	<0.0022
Total PCBs	TPCB	mg/kg	<0.00945	<0.0091	<0.00945	<0.00915	<0.0098
VOLATILE ORGANIC COMPOUNDS							
1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	<0.00069	<0.0005	<0.00077	<0.00066	<0.00062
1,1,1-Trichloroethane	71-55-6	mg/kg	<0.0017	<0.0005	<0.0019	<0.0016	<0.0015
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
1,1,2-Trichlor-1,2,2-trifluoroethane	76-13-1	mg/kg	<0.0013	<0.0005	<0.0014	<0.0012	<0.0011
1,1,2-Trichloroethane	79-00-5	mg/kg	<0.002	<0.0005	<0.0022	<0.0019	<0.0018
1,1-Dichloroethane	75-34-3	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
1,1-Dichloroethene	75-35-4	mg/kg	<0.0015	<0.0005	<0.0017	<0.0014	<0.0013
1,2,4-Trichlorobenzene	120-82-1	mg/kg	<0.00089	<0.0006	<0.00099	<0.00085	<0.00079
1,2,4-Trimethylbenzene	95-63-6	mg/kg	<0.00079	<0.0005	<0.00088	<0.00075	<0.0007
1,2-Dibromoethane	106-93-4	mg/kg	<0.00069	<0.0005	<0.00077	<0.00066	<0.00062
1,2-Dichlorobenzene	95-50-1	mg/kg	<0.00079	<0.0005	<0.00088	<0.00075	<0.0007
1,2-Dichloroethane	107-06-2	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
1,2-Dichloropropane	78-87-5	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
1,3,5-Trimethylbenzene	108-67-8	mg/kg	<0.00079	<0.0005	<0.00088	<0.00075	<0.0007
1,3-Dichlorobenzene	541-73-1	mg/kg	<0.00089	<0.0005	<0.00099	<0.00085	<0.00079

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< - Analyte not detected above the SDL

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U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - East Ditch Riparian Soil Post Response Action
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			ESSB10 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units					
1,4-Dichlorobenzene	106-46-7	mg/kg	<0.00069	<0.0005	<0.00077	<0.00066	<0.00062
2-Butanone	78-93-3	mg/kg	<0.0022	<0.0014	<0.0024	<0.0021	<0.0019
2-Hexanone	591-78-6	mg/kg	<0.0017	<0.00099	<0.0019	<0.0016	<0.0015
4-Methyl-2-pentanone	108-10-1	mg/kg	<0.00099	<0.00099	<0.0011	<0.00094	<0.00088
Acetone	67-64-1	mg/kg	<0.0045	<0.002	<0.0051	<0.0043	<0.0041
Benzene	71-43-2	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
Bromodichloromethane	75-27-4	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
Bromoform	75-25-2	mg/kg	<0.00069	<0.0005	<0.00077	<0.00066	<0.00062
Bromomethane	74-83-9	mg/kg	<0.00099	<0.00099	<0.0011	<0.00094	<0.00088
Carbon disulfide	75-15-0	mg/kg	<0.0016	<0.00099	<0.0018	<0.0015	<0.0014
Carbon tetrachloride	56-23-5	mg/kg	<0.0012	<0.0005	<0.0013	<0.0011	<0.0011
Chlorobenzene	108-90-7	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
Chloroethane	75-00-3	mg/kg	<0.00099	<0.00099	<0.0011	<0.00094	<0.00088
Chloroform	67-66-3	mg/kg	<0.0018	<0.0005	<0.002	<0.0017	<0.0016
Chloromethane	74-87-3	mg/kg	<0.00089	<0.00099	<0.00099	<0.00085	<0.00079
cis-1,2-Dichloroethene	156-59-2	mg/kg	<0.0015	<0.0005	<0.0017	<0.0014	<0.0013
cis-1,3-Dichloropropene	10061-01-5	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
Cyclohexane	110-82-7	mg/kg	<0.0012	<0.0005	<0.0013	<0.0011	<0.0011
Dibromochloromethane	124-48-1	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
Dichlorodifluoromethane	75-71-8	mg/kg	<0.0018	<0.0005	<0.002	<0.0017	<0.0016
Ethylbenzene	100-41-4	mg/kg	<0.00089	<0.0005	<0.00099	<0.00085	<0.00079
Isopropylbenzene	98-82-8	mg/kg	<0.00099	<0.0005	<0.0011	<0.00094	<0.00088
Methyl acetate	79-20-9	mg/kg	<0.00099	<0.0005	<0.0011	<0.00094	<0.00088
Methyl tert-butyl ether	1634-04-4	mg/kg	<0.0019	<0.0005	<0.0021	<0.0018	<0.0017
Methylcyclohexane	108-87-2	mg/kg	<0.0015	<0.0005	<0.0017	<0.0014	<0.0013
Methylene chloride	75-09-2	mg/kg	<0.0025	0.0022 U	0.0034 J	<0.0024	0.0036 JH
Naphthalene	91-20-3	mg/kg	<0.00079	<0.0005	<0.00088	<0.00075	<0.0007
n-Butylbenzene	104-51-8	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
n-Propylbenzene	103-65-1	mg/kg	<0.00089	<0.0005	<0.00099	<0.00085	<0.00079
sec-Butylbenzene	135-98-8	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
Styrene	100-42-5	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
tert-Butylbenzene	98-06-6	mg/kg	<0.00059	<0.0005	<0.00066	<0.00057	<0.00053
Tetrachloroethene	127-18-4	mg/kg	<0.00099	<0.0006	<0.0011	<0.00094	<0.00088
Toluene	108-88-3	mg/kg	<0.00069	<0.0005	<0.00077	<0.00066	<0.00062
trans-1,2-Dichloroethene	156-60-5	mg/kg	<0.00089	<0.0005	<0.00099	<0.00085	<0.00079
trans-1,3-Dichloropropene	10061-02-6	mg/kg	<0.00049	<0.0005	<0.00055	<0.00047	<0.00044
Trichloroethene	79-01-6	mg/kg	<0.0016	<0.0005	<0.0018	<0.0015	<0.0014
Trichlorofluoromethane	75-69-4	mg/kg	<0.00079	<0.0005	<0.00088	<0.00075	<0.0007
Vinyl chloride	75-01-4	mg/kg	<0.00099	<0.0005	<0.0011	<0.00094	<0.00088
Xylenes, Total	1330-20-7	mg/kg	<0.0026	<0.0015	<0.0029	<0.0025	<0.0023
SEMICVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	92-52-4	mg/kg	<0.0019	<0.0032	<0.0019	<0.0018	<0.0019
1-Methylnaphthalene	90-12-0	mg/kg	<0.0019	<0.0026	0.0021 J	0.0031 J	<0.0019
2,4,5-Trichlorophenol	95-95-4	mg/kg	<0.0019	<0.0031	<0.0019	<0.0018	<0.0019
2,4,6-Trichlorophenol	88-06-2	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
2,4-Dichlorophenol	120-83-2	mg/kg	<0.0019	<0.0024	<0.0019	<0.0018	<0.0019
2,4-Dimethylphenol	105-67-9	mg/kg	<0.0019	<0.0037 JL	<0.0019	<0.0018	<0.0019
2,4-Dinitrophenol	51-28-5	mg/kg	<0.0038	<0.0037 JL	<0.0038	<0.0038	<0.004
2,4-Dinitrotoluene	121-14-2	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
2,6-Dinitrotoluene	606-20-2	mg/kg	<0.0019	<0.0036	<0.0019	<0.0018	<0.0019
2-Chloronaphthalene	91-58-7	mg/kg	<0.0019	<0.0046	<0.0019	<0.0018	<0.0019
2-Chlorophenol	95-57-8	mg/kg	<0.0019	<0.0036	<0.0019	<0.0018	<0.0019
2-Methylnaphthalene	91-57-6	mg/kg	<0.0019	<0.003	0.0041 J	0.0061 J	<0.0019
2-Methylphenol	95-48-7	mg/kg	<0.0019	<0.0032	<0.0019	<0.0018	<0.0019
2-Nitroaniline	88-74-4	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
2-Nitrophenol	88-75-5	mg/kg	<0.0019	<0.0051	<0.0019	<0.0018	<0.0019
3&4-Methylphenol	106-44-5	mg/kg	<0.0019	<0.0031	<0.0019	0.0024 J	<0.0019
3,3'-Dichlorobenzidine	91-94-1	mg/kg	<0.0019	<0.0034	<0.0019	<0.0018	<0.0019
3-Nitroaniline	99-09-2	mg/kg	<0.0019	<0.0029	<0.0019	<0.0018	<0.0019
4,6-Dinitro-2-methylphenol	534-52-1	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
4-Bromophenyl phenyl ether	101-55-3	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
4-Chloro-3-methylphenol	59-50-7	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
4-Chloroaniline	106-47-8	mg/kg	<0.0019	<0.0024	<0.0019	<0.0018	<0.0019

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

Soil Analytical Data Summary - East Ditch Riparian Soil Post Response Action
Brine Services Company Superfund Site

Sample Location Sample Depth Sample Date			ESSB10 0-0.5 ft 1/4/2012	ESSS01 0-0.5 ft 10/12/2010	ESSS12 0-0.5 ft 1/4/2012	ESSB10 1-2 ft 1/4/2012	ESSB12 1-2 ft 1/4/2012
Analyte	CAS No.	Units					
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	<0.0019	<0.0024	<0.0019	<0.0018	<0.0019
4-Nitroaniline	100-01-6	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
4-Nitrophenol	100-02-7	mg/kg	<0.0038	<0.0042	<0.0038	<0.0038	<0.004
Acenaphthene	83-32-9	mg/kg	0.0021 J	<0.0024	<0.0019	<0.0018	<0.0019
Acenaphthylene	208-96-8	mg/kg	<0.0019	<0.0024	<0.0019	<0.0018	<0.0019
Acetophenone	98-86-2	mg/kg	<0.0019	<0.0027	0.0051 U	0.0024 U	<0.0019
Anthracene	120-12-7	mg/kg	0.0044 J	<0.0024	0.0024 J	0.0047 J	<0.0019
Benz(a)anthracene	56-55-3	mg/kg	0.014	<0.0031	0.0099	0.025	0.0029 J
Benzaldehyde	100-52-7	mg/kg	<0.0019	<0.0051 JL	0.0047 J	<0.0018 JL	0.0061 J
Benzo(a)pyrene	50-32-8	mg/kg	0.012	<0.0026	0.0091	0.027	0.0026 J
Benzo(b)fluoranthene	205-99-2	mg/kg	0.018	<0.0037	0.014	0.032	0.0033 J
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.011	<0.0032	0.021	0.024	0.0029 J
Benzo(k)fluoranthene	207-08-9	mg/kg	0.0081	<0.0037	0.0072 J	0.014	<0.0019
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	<0.0019	<0.0027	<0.0019	<0.0018	<0.0019
Bis(2-chloroethyl)ether	111-44-4	mg/kg	<0.0019	<0.0031	<0.0019	<0.0018	<0.0019
Bis(2-chloroisopropyl)ether	108-60-1	mg/kg	<0.0019	<0.003	<0.0019	<0.0018	<0.0019
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	0.0051 U	<0.0073	0.011	0.012	0.015
Butyl benzyl phthalate	85-68-7	mg/kg	<0.0032	<0.0028	0.0054 J	<0.0032	<0.0034
Caprolactam	105-60-2	mg/kg	<0.0023	<0.0027	<0.0023	<0.0023	0.0047 J
Carbazole	86-74-8	mg/kg	0.003 J	<0.0024	0.0024 J	0.0036 J	<0.0019
Chrysene	218-01-9	mg/kg	0.014	<0.0032	0.0088	0.027	0.0027 U
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.0038 J	<0.0024	0.0042 J	<0.0023	<0.0024
Dibenzofuran	132-64-9	mg/kg	<0.0019	<0.0024	<0.0019	<0.0018	<0.0019
Diethyl phthalate	84-66-2	mg/kg	<0.0019	<0.0037	0.0021 U	<0.0018	<0.0019
Dimethyl phthalate	131-11-3	mg/kg	<0.0023	<0.0027	<0.0023	<0.0023	<0.0024
Di-n-butyl phthalate	84-74-2	mg/kg	<0.0023	<0.0028	0.0065 J	0.0047 U	0.0043 U
Di-n-octyl phthalate	117-84-0	mg/kg	<0.0023	<0.0032	<0.0023	0.0023 U	<0.0024
Fluoranthene	206-44-0	mg/kg	0.02	0.0031 J	0.015	0.036	0.0048 J
Fluorene	86-73-7	mg/kg	<0.0019	<0.0024	<0.0019	0.0024 J	<0.0019
Hexachlorobenzene	118-74-1	mg/kg	<0.0019	<0.0029	<0.0019	<0.0018	<0.0019
Hexachlorobutadiene	87-68-3	mg/kg	<0.0019	<0.0049	<0.0019	<0.0018	<0.0019
Hexachlorocyclopentadiene	77-47-4	mg/kg	<0.0019	<0.004	<0.0019	<0.0018 JL	<0.0019
Hexachloroethane	67-72-1	mg/kg	<0.0019	<0.0043	<0.0019	<0.0018	<0.0019
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.0095	<0.0039	0.0081	0.022	0.0027 J
Isophorone	78-59-1	mg/kg	<0.0019	<0.0033	<0.0019	<0.0018	<0.0019
Naphthalene	91-20-3	mg/kg	<0.0019	<0.0037	0.0043 J	0.0029 J	<0.0019
Nitrobenzene	98-95-3	mg/kg	<0.0019	<0.0037	<0.0019	<0.0018	<0.0019
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	<0.0023	<0.0044	<0.0023	<0.0023	<0.0024
N-Nitrosodiphenylamine	86-30-6	mg/kg	<0.0023	<0.0024	<0.0023	<0.0023	<0.0024
Pentachlorophenol	87-86-5	mg/kg	<0.0021	<0.0031	<0.0021	<0.0021	<0.0022
Phenanthrene	85-01-8	mg/kg	0.014	<0.0033	0.008	0.021	0.0033 U
Phenol	108-95-2	mg/kg	<0.0023	<0.0037	<0.0023	<0.0023	<0.0024
Pyrene	129-00-0	mg/kg	0.017	<0.0024	0.014	0.036	0.0031 U
Low Molecular Weight PAHs	LPAH	mg/kg	0.0243	0.0196	0.0217	0.0389	0.009
High Molecular Weight PAHs	HPAH	mg/kg	0.0808	0.0168	0.061	0.1522	0.0173
Total PAHs	TPAH	mg/kg	0.1527	0.0535	0.1351	0.2862	0.0371

Bolded - detection above the SDL

< - Analyte not detected above the SDL

J - Concentration is estimated; L - Low bias, H - High bias

U - Detection qualified as non-detect

--- Not Analyzed

AVS-SEM Analytical Data Summary
East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Location	Background	Background	Background	Background	Background	Background	Background	Background	South	North								
			Sample Date	EDBSD03	EDBSD05	EDBSD06	EDBSD07	EDBSD08	EDBSD09	EDBSD10	EDBSD11	EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08
				11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/18/2010	11/17/2010
Percent Moisture	TMOIST	%	34.3	29.8	20	23	25.9	33	33.8	30.8	42.2	36.3	25.6	21.3	29.3	24.6	36.8	32.9	35.4	36.4
Acid-Volatile Sulfide	18496-25-8	uMole/g	0.021	0.026	0.026	0.061	0.235	0.166	0.029	0.251	0.111	0.116	0.148	0.229	0.065	0.044	0.72	0.209	0.293	6.25
Total Solids	TS	%	75.4	76.6	74.9	67.7	68.2	68.7	67.7	62.2	61.2	58.4	77.1	72.3	68.7	72.8	64.2	58.5	58.4	64.8
Cadmium	7440-43-9	uMole/g	0.0006	0.0007	0.00072	0.00076	0.00072	0.00076	0.00079	0.0010	0.00087	0.00092	0.0013	0.0010	0.0010	0.00075	0.00082	0.00092	0.0010	0.0055
Copper	7440-50-8	uMole/g	0.0174	0.0163	0.0105	0.0046	0.0128	0.0084	0.0153	0.0230	0.0092	0.0124	0.0164	0.0097	0.0450	0.0107	0.0052	0.0102	0.0286	0.0367
Lead	7439-92-1	uMole/g	0.0140	0.0100	0.0070	0.0080	0.0280	0.0070	0.0110	0.0190	0.0280	0.0340	0.0230	0.0210	0.0290	0.0120	0.0140	0.0200	0.1040	0.0730
Nickel	7440-02-0	uMole/g	0.0070	0.0100	0.0060	0.0080	0.0100	0.0090	0.0110	0.0160	0.0090	0.0160	0.0100	0.0120	0.0070	0.0120	0.0090	0.0110	0.0100	
Zinc	7440-66-6	uMole/g	0.06	0.04	0.01	0.03	0.12	0.02	0.04	0.11	0.10	0.10	0.07	0.20	0.17	0.04	0.07	0.08	0.26	2.56
Σ SEM			0.10	0.08	0.04	0.05	0.17	0.05	0.08	0.17	0.14	0.16	0.13	0.24	0.26	0.07	0.10	0.12	0.40	2.69
pH	PH	pH units	8	8.33	8.61	8.19	8.56	8.38	8.23	8.41	8	6.35	8.35	7.78	7.88	7.65	7.24	8.12	7.55	7.84
Total Organic Carbon	TOC	wt% dry	1.29	1.02	0.33	0.585	1.32	1.48	1.42	1.45	1.96	2.03	0.675	1.13	1.25	0.659	1.86	1.48	2.09	1.23
Σ SEM/AVS			4.54	2.91	1.50	0.82	0.71	0.30	2.69	0.67	1.30	1.38	0.85	1.05	4.00	1.61	0.14	0.58	1.37	0.43
foc		g_{oc}/g_{sed}	0.0129	0.0102	0.0033	0.00585	0.0132	0.0148	0.0142	0.0145	0.0196	0.0203	0.00675	0.0113	0.0125	0.00659	0.0186	0.0148	0.0209	0.0123
Σ SEM-AVS		$\mu\text{mol}/g_{sed}$	0.074	0.050	0.013	NA	NA	NA	0.049	NA	0.034	0.044	NA	0.012	0.195	0.027	NA	NA	0.108	NA
$(\Sigma$ SEM-AVS)/foc		$\mu\text{mol}/g_{oc}$	5.8	4.9	3.9	NA	NA	NA	3.4	NA	1.7	2.2	NA	1.0	15.6	4.0	NA	NA	5.1	NA

For organic carbon-normalized excess Σ SEM ratios $\leq 130 \mu\text{mol}/g_{oc}$, the samples are predicted to be non-toxic; values between 130 and 3,000 $\mu\text{mol}/g_{oc}$ lie where the prediction of toxicity is uncertain; and values greater than 3,000 $\mu\text{mol}/g_{oc}$ are predicted to be toxic (EPA 2005).

United States Environmental Protection Agency (EPA), 2005. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Metal Mixtures (Cadmium, Copper, Lead, Nickel, Silver, and Zinc). Office of Research and Development, Washington, DC. EPA-600-R-02-011.

Arsenic	7440-38-2	uMole/g	EDBSD03	EDBSD05	EDBSD06	EDBSD07	EDBSD08	EDBSD09	EDBSD10	EDBSD11	EDSSD01	EDSSD01	EDSSD02	EDSSD03	EDSSD04	EDSSD05	EDSSD06	EDSSD07	EDSSD08	EDNSD02
Mercury	7439-97-6	uMole/g	0.00005	0.00006	0.00006	0.00007	0.00006	0.00007	0.00007	0.00008	0.00008	0.00008	0.00006	0.00006	0.00007	0.00007	0.00007	0.00008	0.00007	0.00008

Bolded - detection above the SDL

< - Analyte not detected above the SDL

U or - Detection qualified as non-detect

--- Not Analyzed

AVS - Acid volatile sulfide

g - gram

SEM - Simultaneously extracted metals

% - Percent

AVS-SEM Analytical Data Summary
East Ditch
Brine Service Company Superfund Site

Analyte	CAS No.	Location	North		North		North		North		North		North		North		North		North		North	
			EDNSD03 11/17/2010	EDNSD03 11/17/2010	EDNSD04 11/17/2010	EDNSD05 11/17/2010	EDNSD06 11/17/2010	EDNSD07 11/17/2010	EDNSD08 11/17/2010	EDDS01 11/16/2010	EDDS02 11/16/2010	EDDS03 11/16/2010	EDDS04 11/16/2010	EDDS05 11/16/2010	EDDS06 11/16/2010	EDDS07 11/16/2010	EDDS08 11/16/2010	EDDS09 11/16/2010	EDDS010 11/16/2010			
Percent Moisture	TMOIST	%	37.2	38.3	23.1	34.9	33.3	50.2	41.3	47.8	47.6	44.6	35.3	50.3	36.2	23.9	34.4	34.9	38			
Acid-Volatile Sulfide	18496-25-8	uMole/g	1.72	9.16	1.19	0.77	0.84	3.52	5.48	5.8	0.027	13.5	30.9	12.5	1.72	94.2	396	35.9	16.6			
Total Solids	TS	%	60.9	50.2	71.6	58.8	56.2	57.5	53	---	---	---	---	---	---	---	---	---	---	---	---	
Cadmium	7440-43-9	uMole/g	0.0035	0.0041	0.0056	0.0016	0.0015	0.0014	0.0062	0.0062	0.0050	0.0117	0.1050	0.0064	0.0071	0.0149	0.0146	0.0096	0.0046			
Copper	7440-50-8	uMole/g	0.0075	0.0053	0.0101	0.0054	0.0096	0.0040	0.0069	0.0410	0.0556	0.0039	0.0056	0.0057	0.0163	0.0039	0.0104	0.006	0.0029			
Lead	7439-92-1	uMole/g	0.13 J	0.257 J	0.0510	0.0660	0.0300	0.0310	0.0870	0.0840	0.0640	0.1030	0.1140	0.072	0.058	0.047	0.147	0.108	0.031			
Nickel	7440-02-0	uMole/g	0.0120	0.0180	0.0120	0.0080	0.0110	0.0090	0.0170	0.0230	0.0330	0.0090	0.0140	0.012	0.013	0.017	0.061	0.017	0.006			
Zinc	7440-66-6	uMole/g	1.34	1.71	0.66	0.42	0.67	0.49	1.76	2.65	1.98	1.97	1.99	1.24	1.11	0.756	1.66	1.85	0.517			
Σ SEM			1.36	1.74	0.74	0.50	0.72	0.54	1.88	2.80	2.14	2.10	2.23	1.34	1.20	0.84	1.89	1.99	0.56			
pH	PH	pH units	7.61	7.74	8.55	7.2	6.91	7.09	7.33	7.05	7.23	7.78	7.49	7.05	7.23	7.45	7.02	7.71	7.16			
Total Organic Carbon	TOC	wt% dry	2.55	2.48	1.37	1.56	1.86	2.05	4.19	3.13	2.46	2.09	2.35	3.71	3.23	2.63	0.928	3.15	2.69			
Σ SEM/AVS			0.79	0.19	0.62	0.65	0.86	0.15	0.34	0.48	79.17	0.16	0.07	0.11	0.70	0.01	0.005	0.06	0.03			
foc		g _{oc} /g _{sed}	0.0255	0.0248	0.0137	0.0156	0.0186	0.0205	0.0419	0.0313	0.0246	0.0209	0.0235	0.0371	0.0323	0.0263	0.00928	0.0315	0.0269			
Σ SEM-AVS		μmol/g _{sed}	NA	NA	2.111	NA																
(Σ SEM-AVS)/foc		μmol/g _{oc}	NA	NA	85.8	NA																

For organic carbon-normalized excess Σ SEM ratio; toxicity is uncertain; and values greater than 100 are considered to be unreliable.

United States Environmental Protection Agency

		EDNSD03	EDNSD03	EDNSD04	EDNSD05	EDNSD06	EDNSD07	EDNSD08	EDDS01	EDDS02	EDDS03	EDDS04	EDDS05	EDDS06	EDDS07	EDDS08	EDDS09	EDDS010	
Arsenic	7440-38-2	uMole/g	0.0272	0.0301	0.0228	0.0269	0.0284	0.0287	0.0311	0.0271	0.0221	0.033	0.041	0.0486	0.0231	0.033	0.0882	0.0319	0.0248
Mercury	7439-97-6	uMole/g	0.00008	0.00009	0.00007	0.00008	0.00008	0.00009	0.00009	0.000081	0.000139	0.000098	0.000122	0.000145	0.000069	0.000099	0.000263	0.000095	0.000074

Bolded - detection above the SDL

< - Analyte not detected above the SDL

U or - Detection qualified as non-detect

--- Not Analyzed

AVS - Acid volatile sulfide

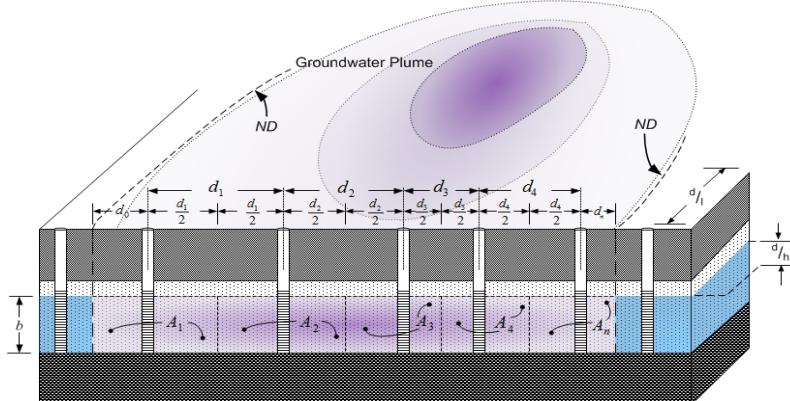
g - gram

SEM - Simultaneously extracted metals

% - Percent

Appendix C - Discharge Weighted Representative Concentration and Dilution Factor Calculations

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D.2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D.2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
8.00E-04 mg/L	2.03E-03 mg/L	3.73E-02 mg/L	9.02E-03 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

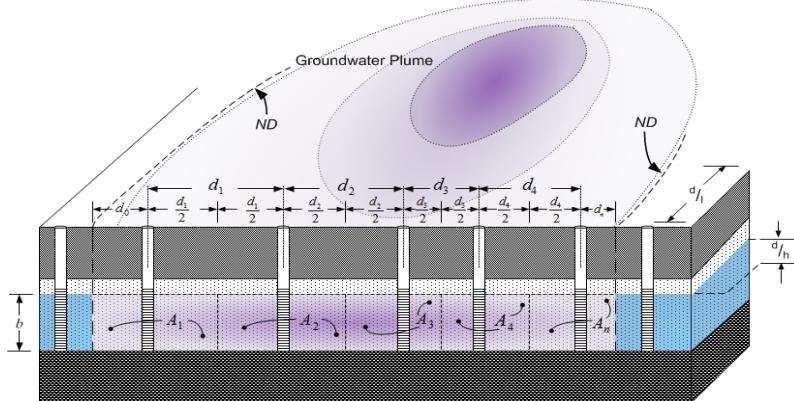
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.86E-06 \text{ mg/s}}{5.32E-06 \text{ mg/s}} \quad \frac{1.14E-04 \text{ mg/s}}{2.18E-05 \text{ mg/s}} \quad \frac{8.55E-05 \text{ mg/s}}{1.08E-04 \text{ mg/s}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{1.43E-04 \text{ mg/s}} \quad \frac{8.55E-05 \text{ cfs}}{3.68E-04 \text{ cfs}}$$

$$\frac{\sum \dot{m}_{coc}}{\sum Q_{gw}} = \frac{1.43E-04 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.38E-02 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
5.55E-01 mg/L	8.22E-01 mg/L	2.13E+00 mg/L	3.56E-01 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

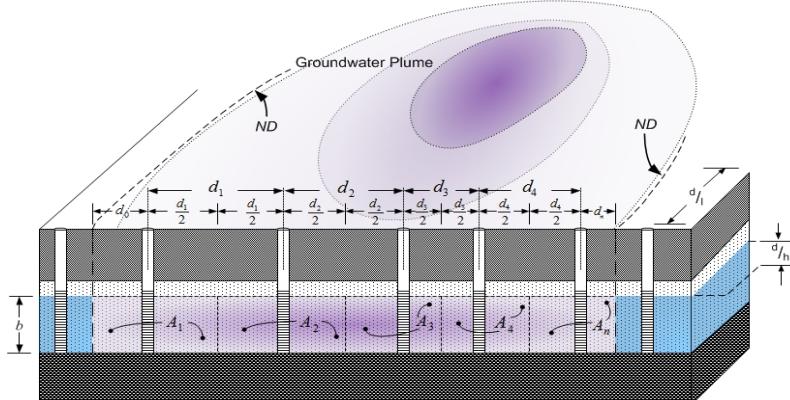
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.29E-03 \text{ mg/s}}{2.15E-03 \text{ mg/s}} \quad \frac{6.53E-03 \text{ mg/s}}{8.62E-04 \text{ mg/s}} \quad \frac{1.08E-02 \text{ mg/s}}{3.68E-04 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}} \quad \frac{1.04E+00 \text{ mg/L}}{3.68E-04 \text{ cfs}}$$

$$\sum \dot{m}_{coc} = \frac{1.08E-02 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.04E+00 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
1.00E-03 mg/L	3.11E-03 mg/L	1.66E-02 mg/L	2.83E-03 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

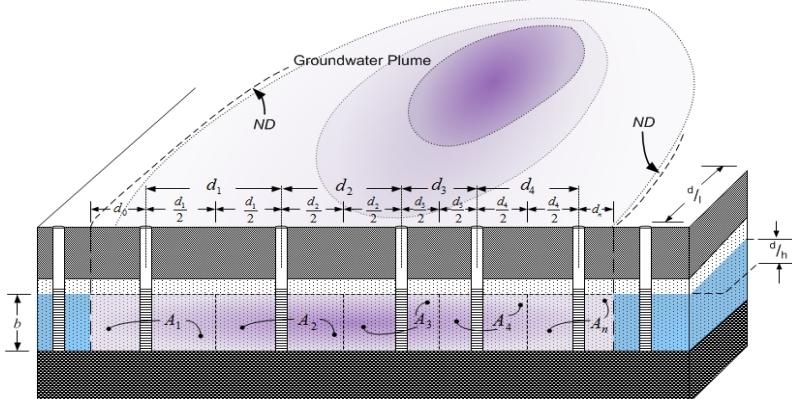
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{2.32E-06 \text{ mg/s}}{8.14E-06 \text{ mg/s}} \quad \frac{5.09E-05 \text{ mg/s}}{6.86E-06 \text{ mg/s}} \quad \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{1.08E-04 \text{ cfs}} \quad \frac{8.55E-05 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$\sum \frac{\dot{m}_{coc}}{Q_{gw}} = \frac{6.82E-05 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 6.54E-03 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D.2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D.2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
1.00E-03 mg/L	4.18E-03 mg/L	1.26E-02 mg/L	5.71E-03 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

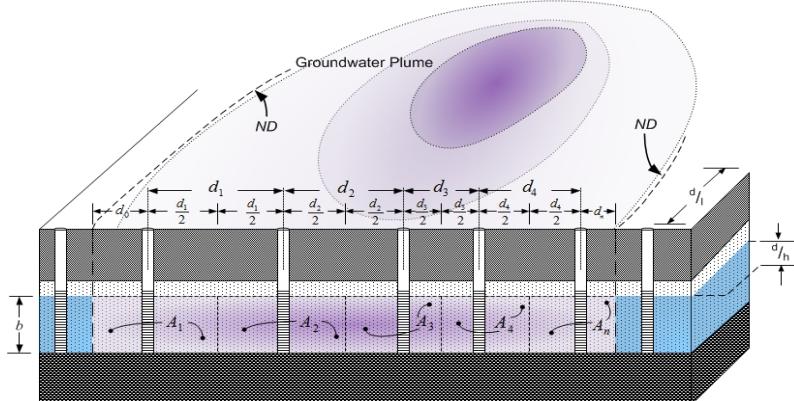
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{2.32E-06 \text{ mg/s}}{1.09E-05 \text{ mg/s}} \quad \frac{3.86E-05 \text{ mg/s}}{1.38E-05 \text{ mg/s}} \quad \frac{6.57E-05 \text{ mg/s}}{3.68E-04 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$\sum \dot{m}_{coc} = \frac{6.57E-05 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 6.31E-03 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D.2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D.2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
2.10E-05 mg/L	2.50E-05 mg/L	1.25E-05 mg/L	1.25E-06 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

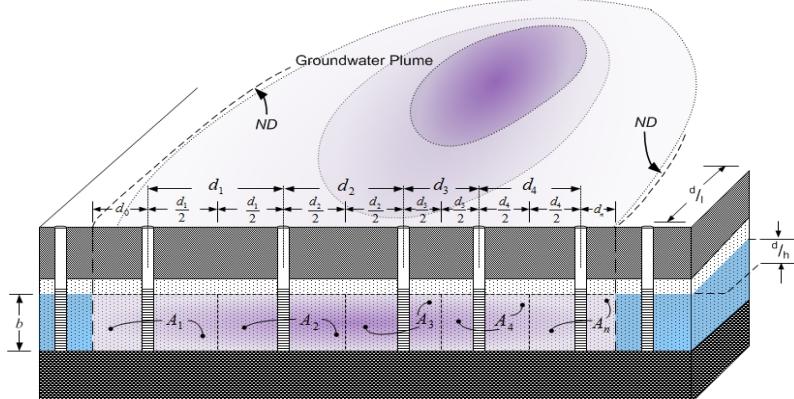
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{4.87E-08 \text{ mg/s}}{6.55E-08 \text{ mg/s}} \quad \frac{3.83E-08 \text{ mg/s}}{3.03E-09 \text{ mg/s}} \quad \frac{1.56E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$\sum \dot{m}_{coc} = \frac{1.56E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.49E-05 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
6.00E-07 mg/L	1.25E-06 mg/L	6.00E-06 mg/L	1.60E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

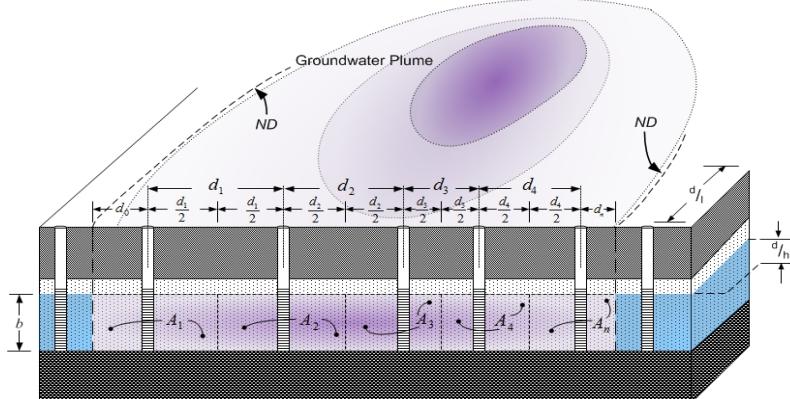
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.39E-09 \text{ mg/s}}{3.27E-09 \text{ mg/s}} \quad \frac{1.84E-08 \text{ mg/s}}{3.88E-08 \text{ mg/s}} \quad \frac{5.93E-06 \text{ mg/L}}{6.18E-08 \text{ mg/s}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$\sum \dot{m}_{coc} = \frac{6.18E-08 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 5.93E-06 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D.2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D.2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
5.00E-06 mg/L	1.25E-06 mg/L	6.00E-06 mg/L	2.00E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

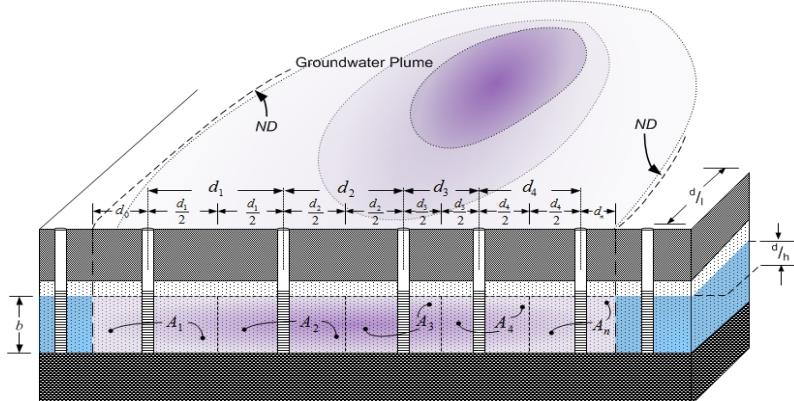
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.16E-08 \text{ mg/s}}{8.17E-08 \text{ mg/s}} \quad \frac{3.27E-09 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \frac{1.84E-08 \text{ mg/s}}{1.08E-04 \text{ cfs}} \quad \frac{4.84E-08 \text{ mg/s}}{8.55E-05 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{9.24E-05 \text{ cfs}}{3.68E-04 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}} \quad \frac{8.55E-05 \text{ cfs}}{7.84E-06 \text{ mg/L}}$$

$$\sum \dot{m}_{coc} = \frac{8.17E-08 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 7.84E-06 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
2.90E-06 mg/L	6.50E-05 mg/L	6.00E-06 mg/L	6.00E-07 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

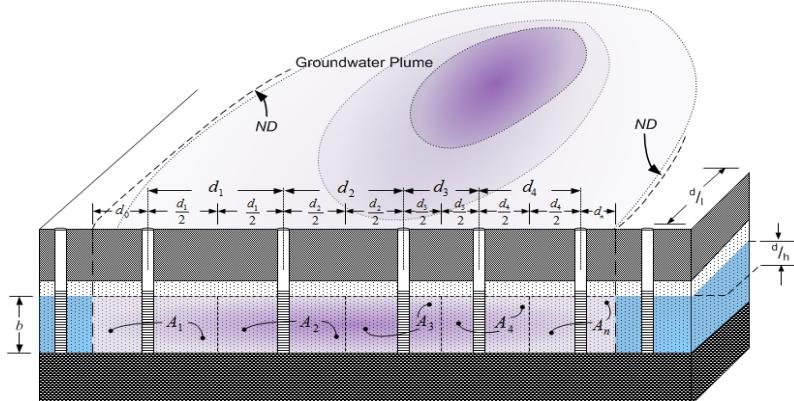
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{6.73E-09 \text{ mg/s}}{1.70E-07 \text{ mg/s}} \quad \frac{1.84E-08 \text{ mg/s}}{1.45E-09 \text{ mg/s}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$\sum \frac{\dot{m}_{coc}}{Q_{gw}} = \frac{1.97E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.89E-05 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
1.25E-06 mg/L	2.50E-05 mg/L	1.25E-05 mg/L	2.30E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

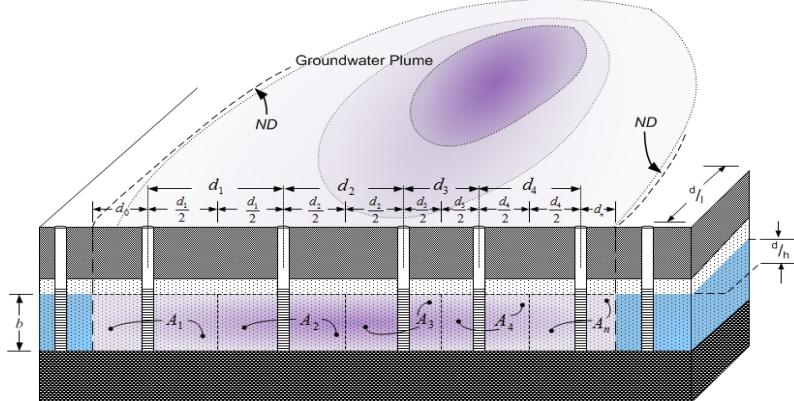
Aquifer saturated thickness discharging to surface water (ft):

b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{2.90E-09 \text{ mg/s}}{6.55E-08 \text{ mg/s}} \quad \frac{3.83E-08 \text{ mg/s}}{5.57E-08 \text{ mg/s}} \quad \frac{8.19E-05 \text{ cfs}}{9.24E-05 \text{ cfs}} \quad \frac{1.08E-04 \text{ cfs}}{8.55E-05 \text{ cfs}}$$

$$Q_{gw} = \frac{1.62E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.56E-05 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
1.25E-06 mg/L	2.50E-05 mg/L	1.25E-05 mg/L	6.70E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

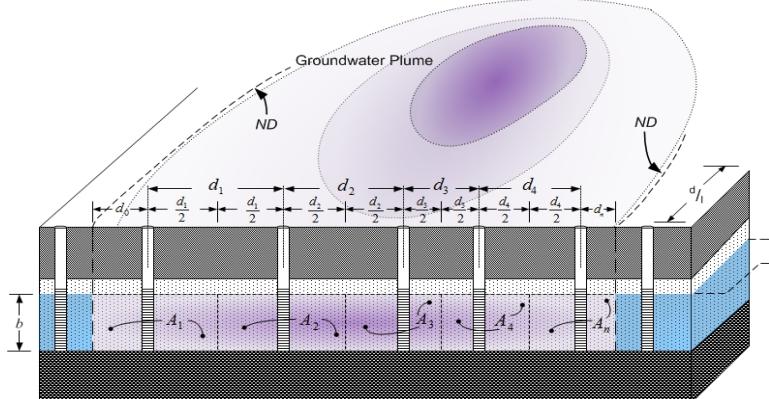
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{2.90E-09 \text{ mg/s}}{6.55E-08 \text{ mg/s}} \quad \frac{3.83E-08 \text{ mg/s}}{1.62E-07 \text{ mg/s}} \quad \frac{8.55E-05 \text{ cfs}}{3.68E-04 \text{ cfs}}$$

$$Q_{gw} = \frac{2.69E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}}$$

$$\sum \dot{m}_{coc} = \frac{2.69E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 2.58E-05 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
 5. Enter remaining COC and aquifer parameter data from each respective monitoring well
 6. Enter values IN UNITS DENOTED
 7. Representative groundwater concentration displayed in blue box at bottom
 8. DELETE DATA IN COLUMNS WITH NO WELL DESIGNATION
- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D.2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D.2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
6.00E-07 mg/L	1.25E-05 mg/L	6.00E-06 mg/L	3.10E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

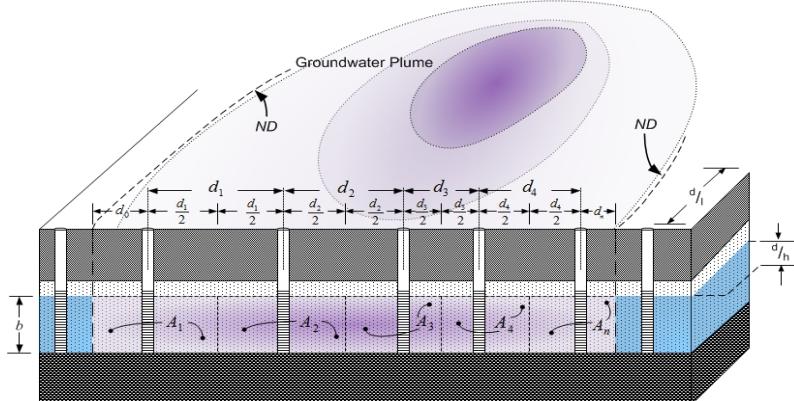
b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.39E-09 \text{ mg/s}}{8.19E-05 \text{ cfs}} \frac{3.27E-08 \text{ mg/s}}{9.24E-05 \text{ cfs}} \frac{1.84E-08 \text{ mg/s}}{1.08E-04 \text{ cfs}} \frac{7.51E-08 \text{ mg/s}}{8.55E-05 \text{ cfs}}$$

$$Q_{gw} = \frac{8.19E-05 \text{ cfs}}{3.68E-04 \text{ cfs}}$$

$$\frac{\sum \dot{m}_{coc}}{\sum Q_{gw}} = \frac{1.28E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}} \quad \bar{C}_{gw} = 1.22E-05 \text{ mg/L}$$

TRRP-15eco: Discharge-Weighted Representative Groundwater COC Concentration at Surface Water Interface (v. 1.2 Oct 2012)



INSTRUCTIONS:

1. Calculator solves general condition described in [EQ 12], below
 2. Enter data only in uncolored cells
 3. BEGIN by entering monitoring well designations starting with "Well 1," and consistent with the order presented in Figure D.2 (Appendix D, TRRP-15eco) and reproduced here - Up to 10 groundwater/surface water interface monitoring wells may be entered
 4. Enter distances as shown in Figure D.2 (Appendix D, TRRP-15eco)
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- (table below contains example D.1 information - replace with site well information)

$$\bar{C}_{gw} = \frac{C_{gw_1} K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(C_{gw_i} K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + C_{gw_n} K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}{K_1 \frac{dh}{dl_1} \eta_{e_1} \left(d_0 + \frac{d_1}{2} \right) b_1 + \sum_{i=2}^{n-1} \left(K_i \frac{dh}{dl_i} \eta_{e_i} \left(\frac{d_{i-1} + d_i}{2} \right) b_i \right) + K_n \frac{dh}{dl_n} \eta_{e_n} \left(\frac{d_{n-1} + d_n}{2} \right) b_n}$$

[EQ 12]

Number of monitoring wells inside GW plume: **n = 4**

Monitoring Wells

Enter designation of monitoring wells in plume (from d_0 ; see Figure D2):

Well 1	Well 2	Well 3	Well 4					
MW-05	MW-04	MW-16	MW-15					

Interwell Distances

Enter interwell and plume-edge distances per Figure D-2 (ft):

d0	d1	d2	d3	d4				
85.0 ft	220.0 ft	220.0 ft	295.0 ft	56.0 ft				

Groundwater Concentrations

Enter groundwater COC concentration from each well in plume (mg/L):

C1	C2	C3	C4					
6.00E-07 mg/L	1.25E-05 mg/L	6.00E-06 mg/L	2.90E-05 mg/L					

Aquifer Parameters

Hydraulic conductivity (cm/s):

K1	K2	K3	K4					
6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s	6.01E-03 cm/s					

Hydraulic gradient (-):

dh/dl1	dh/dl2	dh/dl3	dh/dl4					
0.0021	0.0021	0.0021	0.0021					

Effective porosity (-):

ηe1	ηe2	ηe3	ηe4					
0.29	0.29	0.29	0.29					

Aquifer saturated thickness discharging to surface water (ft):

b1	b2	b3	b4					
3.50 ft	3.50 ft	3.50 ft	3.50 ft					

$$\dot{m}_{coc} = \frac{1.39E-09 \text{ mg/s}}{3.27E-08 \text{ mg/s}} \quad \frac{1.84E-08 \text{ mg/s}}{7.02E-08 \text{ mg/s}} \quad \frac{8.55E-05 \text{ cfs}}{3.68E-04 \text{ cfs}}$$

$$Q_{gw} = \frac{1.23E-07 \text{ mg/s}}{3.68E-04 \text{ cfs}}$$

$$\sum \frac{\dot{m}_{coc}}{Q_{gw}} = \frac{1.18E-05 \text{ mg/L}}{1.23E-07 \text{ mg/s}}$$

Appendix D – Supporting Documentation

Appendix D-1. Uptake Factors

1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Analyte	Terrestrial Invertebrate UF		Terrestrial Plant UF		Mammal UF		Aquatic Plant UF		Benthic Invertebrate UF		Fish UF		Amphibian UF		Aquatic Insect UF	
4,4'-DDD	9.95	DB	0.0621	DB	2.04	DB	0.062	DB	35.6	DB	91.7	DB	35.6	DB	92	DB
4,4'-DDE	9.95	DB	0.0621	DB	2.04	DB	0.062	DB	35.6	DB	91.7	DB	35.6	DB	92	DB
4,4'-DDT	9.95	DB	0.0621	DB	2.04	DB	0.062	DB	35.6	DB	91.7	DB	35.6	DB	92	DB
Aldrin	97.4	DB	0.22	DB	23.6	DB	0.220	DB	35.9	DB	86.3	DB	35.9	DB	86	DB
alpha-BHC	not a soil COC		not a soil COC		not a soil COC		0.002	DB	16	DB	21	DB	16	DB	21	DB
alpha-Chlordane	28.7	DB	0.160	DB	1.46	DB	0.160	DB	8.12	DB	22.8	DB	8.12	DB	23	DB
Antimony	0.301	DB	0.0249	DB	0.0408	DB	0.0249	DB	0.3	DB	0.171	DB	0.3	DB	0.171	DB
Arsenic	0.224	DB	0.0375	DB	0.0025	DB	0.0375	DB	0.127	DB	0.226	DB	0.127	DB	0.226	DB
Barium	0.091	DB	0.156	DB	0.0566	DB	0.156	DB	2.8	DB	0.28	DB	2.8	DB	0.28	DB
Benzaldehyde	1	(a)	2.59	(b)	1	(a)	not a sediment COC for trophic analysis									
Beryllium	0.045	DB	0.21	DB	0.0408	DB	0.208	DB	0.125	DB	0.125	DB	0.125	DB	0.125	DB
beta-BHC	0.3	DB	0.00195	DB	1.46	DB	0.002	DB	16	DB	19.6	DB	16	DB	19.6	DB
bis(2-Ethylhexyl)phthalate	0.67	DB	0.070	DB	0.1	DB	0.070	DB	7.35	DB	15.3	DB	7.35	DB	15.3	DB
Butylbenzylphthalate	not a soil COC		not a soil COC		not a soil COC		0.657	DB	6	DB	0.1	DB	6	DB	0.1	DB
Cadmium	7.708	DB	0.586	DB	0.52164	DB	0.586	DB	0.459	DB	0.42	DB	0.459	DB	0.42	DB
Carbazole	2.31	DB	12.2	DB	0	DB	12.200	DB	3.31	DB	1.02	DB	3.31	DB	1.02	DB
Carbon disulfide	5.8	DB	1.36	DB	0.1	DB	1.360	DB	0.1	DB	0.1	DB	0.1	DB	0.1	DB
Chromium	0.306	DB	0.041	DB	0.0846	DB	0.041	DB	0.083	DB	0.186	DB	0.083	DB	0.186	DB
Cobalt	0.122	DB	0.00745	DB	0.0205	DB	0.00745	DB	0.3	DB	0.171	DB	0.3	DB	0.171	DB
Copper	0.515	DB	0.124	DB	0.2412	DB	0.124	DB	0.661	DB	0.361	DB	0.661	DB	0.361	DB
Cyanide	0.301	DB	0.129	DB	0.0408	DB	0.129	DB	0.3	DB	0.171	DB	0.3	DB	0.171	DB
Cyclohexane	10.9	DB	21.00	DB	0.1	DB	21.000	DB	0.1	DB	0.1	DB	0.1	DB	0.1	DB
delta-BHC	not a soil COC		not a soil COC		not a soil COC		0.00195	DB	16	DB	20.8	DB	16	DB	21	DB
Dibenzofuran	5.72	DB	1.290	DB	1.46	DB	1.290	DB	3.41	DB	0.794	DB	3.41	DB	0.794	DB
Dieldrin	16.7	DB	0.385	DB	4.38	DB	0.385	DB	35.9	DB	86.3	DB	35.9	DB	86.3	DB
Endrin	36.9	DB	0.00577	DB	4.92	DB	0.00577	DB	2.59	DB	17.3	DB	2.59	DB	17.3	DB
Endrin aldehyde	4.7	DB	0.682	DB	1.46	DB	0.682	DB	3.4	DB	33	DB	3.4	DB	33	DB
gamma-BHC (Lindane)	2.92	DB	0.002	DB	1.46	DB	0.002	DB	26	DB	63	DB	26	DB	63	DB
gamma-Chlordane	28.7	DB	0.160	DB	1.46	DB	0.160	DB	8.12	DB	23	DB	8.12	DB	23	DB
Heptachlor	10.5	DB	2.440	DB	1.46	DB	2.440	DB	69.2	DB	75	DB	69.2	DB	75	DB
Heptachlor epoxide	10.5	DB	2.440	DB	1.46	DB	2.440	DB	69.2	DB	75	DB	69.2	DB	75	DB
High Molecular Weight PAHs	1.77	DB	0.342	DB	0.00001	DB	0.342	DB	2.36	DB	0.0644	DB	2.36	DB	0.0644	DB
Lead	0.0389	DB	0.266	DB	0.073780	DB	0.266	DB	0.08	DB	0.187	DB	0.08	DB	0.187	DB
Low Molecular Weight PAHs	5.93	DB	4.57	DB	0.00001	DB	4.570	DB	2.25	DB	0.431	DB	2.25	DB	0.431	DB
Manganese	0.054	DB	0.0792	DB	0.0205	DB	0.0792	DB	0.19	DB	0.03	DB	0.19	DB	0.03	DB
Mercury	1.693	DB	0.652	DB	0.0543	DB	0.652	DB	2.837	DB	2.62	DB	2.837	DB	2.62	DB
Methylcyclohexane	6.71	DB	2.07	DB	0.1	DB	0.1	DB	0.1	DB	0.1	DB	0.1	DB	0.1	DB
Nickel	1.059	DB	0.018	DB	0.1139	DB	0.018	DB	0.134	DB	0.169	DB	0.134	DB	0.169	DB
Pentachlorophenol	14.6	DB	5.93	DB	0.233	DB	5.930	DB	16.9	DB	16.9	DB	16.9	DB	16.9	DB
Selenium	0.985	DB	0.672	DB	0.5216	DB	0.672	DB	3.66	DB	4.81	DB	3.66	DB	4.81	DB
Silver	2.045	DB	0.014	DB	0.004	DB	0.014	DB	0.18	DB	0.18	DB	0.18	DB	0.18	DB
Thallium	0.301	DB	0.129	DB	0.112	DB	0.129	DB	0.3	DB	0.171	DB	0.3	DB	0.171	DB
Total PCBs	0.28	DB	0.168	DB	0.19	DB	0.1680	DB	4.67	DB	61	DB	4.67	DB	61	DB
Total PAHs	2.32	DB	2.22	DB	0.00001	DB	2.2200	DB	2.32	DB	0.197	DB	2.32	DB	0.197	DB
Vanadium	0.042	DB	0.00485	DB	0.0123	DB	0.00485	DB	0.31	DB	0.033	DB	0.31	DB	0.033	DB
Zinc	3.201	DB	0.366	DB	0.57	DB	3.66E-01	DB	0.84	DB	0.138	DB	0.84	DB	0.138	DB

Primary reference is the TCEQ Database. If other sources or assumptions are used, they are listed below.

(a) In the absence of specific uptake factor information for a chemical or adequate surrogate information, a conservative estimate is that the uptake factor is equal to 1.

Naphthalene used as surrogate for carbazole

(b) Briggs, G., R. Bromilow, and A. Evans. 1982. Relationships Between Lipophilicity and Root Uptake and Translocation of Non-Ionized Chemicals by Barley. Pestic. Sci. 13: 495-504.

Table D-2. Toxicity Reference Values

COPC	Spec	Test Species	Endpoint	Duration	Code	Effect	Administration	Dose (mg/kg-BW/day)	Reference	Dose Adjustment for NOAEL TRV	SLERA NOAEL	Dose Adjustment for LOAEL TRV	SLERA LOAEL
2-Chloronaphthalene		Use Low Molecular Weight PAHs as surrogate											
Acetophenone		Use di-n-butyl phthalate as surrogate					---						
Aldrin		Use Dieldrin as surrogate					---						
alpha-BHC	M	Rat	LOAEL	107 weeks	C	Body weight (18% decrease in body weight gain)	oral in food	56	ATSDR 2003 (Fitzhugh 1950) Sample et al. 1996 (Van Velsen et al. 1986)	--	--	No adjustment	56
alpha-BHC	M	Rat	NOAEL	107 weeks	C	Body weight	oral in food	8		No adjustment	8	--	--
beta-BHC	M	Rat	LOAEL	13 weeks	C	Reproduction (gonadal atrophy in both sexes)	oral in diet	20		--	--	No adjustment	20
beta-BHC	M	Rat	NOAEL	13 weeks	C	Reproduction	oral in diet	4		No adjustment	4	--	--
delta-BHC		Use beta-BHC for mammal surrogate and gamma-BHC for avian surrogate											
gamma-BHC	M	Rat	LOAEL	138 days	C	Reproduction (reduction in fecundity and litter size)	---	10	Smith 1991	--	--	No adjustment	10
gamma-BHC	M	Rat	NOAEL	138 days	C	Reproduction	---	5		No adjustment	5	--	--
gamma-BHC	A	Mallard	LOAEL	8 weeks over sensitive lifestage	C	Reproduction (reduced eggshell thickness, laid fewer eggs, and longer time intervals between egg laying)	oral intubation	20	Sample et al. 1996 (Chakravarty and Lahiri 1986)	Adjusted by 5	4	No adjustment	20
Aluminum	M	Rat	LOAEL	14 days gestation	C	Growth of offspring	1000 mg/kg-diet	88	HSDB 2004 (NRC 1981)	Adjusted by 5	18	No adjustment	88
Aluminum	A	Chicken (1 day old)	LOAEL	14 days	S	Growth rate reduced	diet	500	NAS 1980 (Storer and Nelson 1968)	Adjusted by 20	25	Adjusted by 4	125
Arsenic	M	Dog	NOAEL	---	C	Growth endpoint	---	1.04	U.S. EPA Soil Screening Level for Arsenic 2005	SSL NOAEL, no adjustment	1.04	--	--
Arsenic	M	Dog	LOAEL	---	C	Growth endpoint	---	1.66		--	--	From SSL Document	1.66
Arsenic	A	Chicken	NOAEL	---	C	Lowest NOAEL for growth, repro or survival	---	2.24		SSL NOAEL, no adjustment	2.24	--	--
Arsenic	A	Chicken	LOAEL	---	C	LOAEL for Growth endpoint	---	17.30		--	--	From SSL Document	17.3
Barium	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	52	U.S. EPA Soil Screening Levels for Barium 2005	SSL NOAEL, no adjustment	52	--	--
Barium	M	Vole, Shrew, Weasel	LOAEL	---	C	Geometric mean for reproduction and growth	---	83		--	--	From SSL Document	83
Barium	A	Chick - 1 day old	LOAEL	4 weeks	S	Mortality	Oral in diet	416.53	U.S. EPA Soil Screening Levels for Barium 2005 (Johnson et al. 1960)	Adjusted by 10	41.6	Adjusted by 4	208.2
Benzaldehyde		Use Benzene as surrogate											
Benzene	M	Rat	LOAEL	2 years, 5 d/wk	C	Reproductive, Endometrial polyps	gavage with oil	100	ATSDR 1997 (NTP 1986)	No adjustment	100	--	--
Benzene	M	Rat	NOAEL	2 years, 5 d/wk	C	No Reproductive Effects	gavage with oil	50		--	--	No adjustment	50
bis(2-ethylhexyl) phthalate	M	Mouse	LOAEL	17 days gestation	C	Fetal malformations	diet	91	ATSDR 2002 (Tyl et al. 1988)	--	--	No adjustment	91
bis(2-ethylhexyl) phthalate	M	Mouse	NOAEL	17 days gestation	C	Fetal malformations	diet	44		No adjustment	44	--	--
bis(2-ethylhexyl) phthalate	A	Starlings	LOAEL	30 days	S	Increased body weight	250 mg/kg	35	O'Shea and Stafford 1980	--	--	Adjusted by 4	8.75
bis(2-ethylhexyl) phthalate	A	Starlings	NOAEL	30 days	S	Reduced food consumption, increased body weight	25 mg/kg	3.5		Adjusted by 10	0.348	--	--
Butyl benzyl phthalate	M	Rat	LOAEL	90 days	C	Growth	1.5% in diet	1223	IRIS 2004 (Krauskopf 1973)	--	--	No adjustment	1223
Butyl benzyl phthalate	M	Rat	NOAEL	90 days	C	Growth	1.0% in diet	815		No adjustment	815	--	--
Cadmium	M	Rat	NOAEL	---	C	Geometric mean for reproduction and growth	---	0.770	U.S. EPA 2005 Soil Screening Levels for Cadmium	SSL NOAEL, no adjustment	0.77	--	--
Cadmium	M	Rat	LOAEL	---	C	Growth endpoint	---	7.700		--	--	From SSL Document	7.7
Cadmium	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for reproduction and growth	---	1.47		SSL NOAEL, no adjustment	1.47	--	--
Cadmium	A	Chicken	LOAEL	---	C	Growth endpoint	---	6.35		--	--	From SSL Document	6.35
Carbazole		Use Low Molecular Weight PAHs as surrogate											
Carbon disulfide	M	Rat	LOAEL	10 days, gestation days 6-15	C	Developmental, reduced fetal weight	---	200	ATSDR 1996 (Jones-Price et al. 1984)	--	--	No adjustment	200
Carbon disulfide	M	Rat	NOAEL	10 days, gestation days 6-15	C	Developmental	---	100		No adjustment	100	--	--
cis-chlordane (alpha)	M	Rat	LOAEL	4-5 months	C	Increased mortality and growth retardation	35 mg/kg-diet	2.90	Eisler 1990 (WHO 1984 (Ingle 1967))	--	--	No adjustment	2.9
cis-chlordane (alpha)	M	Rat	NOAEL	4-5 months	C	Mortality and Growth	25 mg/kg-diet	2.00		No adjustment	2	--	--
Chlordane (technical)	M	Rat	LOAEL	3 generations	C	Elevated mortality (11%) in 2nd F3 generation litters, gross and microscopic pathology	60 mg/kg diet	4.90	Eisler 1990 (NRCC 1975, WHO 1984 (Ingle 1967))	--	--	No adjustment	4.9
Chlordane (technical)	M	Rat	NOAEL	3 generations	C	Development	30 mg/kg diet	2.40		No adjustment	2.4	--	--

Table D-2. Toxicity Reference Values

COPC	Spec	Test Species	Endpoint	Duration	Code	Effect	Administration	Dose (mg/kg-BW/day)	Reference	Dose Adjustment for NOAEL TRV	SLERA NOAEL	Dose Adjustment for LOAEL TRV	SLERA LOAEL
Chlordane (technical)	A	Red-winged Blackbird	LOAEL	84 days	C	Mortality (26%)	50 mg/kg in diet	10.7	Sample et al. 1996 (Stickel et al. 1983)	--	--	No adjustment	10.7
Chlordane (technical)	A	Red-winged Blackbird	NOAEL	84 days	C	Mortality	10 mg/kg in diet	2.14		No adjustment	2.14	--	--
Chromium	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	2.40	U.S. EPA 2008 Ecological Soil Screening Levels for Chromium	SSL NOAEL, no adjustment	2.4	---	--
Chromium	M	Vole, Shrew, Weasel	LOAEL	---	C	Geometric mean for reproduction and growth		58.20		---	--	From SSL Document	58.2
Chromium	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for reproduction and growth	---	2.66		SSL NOAEL, no adjustment	2.66	--	--
Chromium	A	Dove, Woodcock and Hawk	LOAEL	---	C	Geometric mean for reproduction and growth		15.6		---	--	From SSL Document	15.6
Cobalt	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	7.33	U.S. EPA 2005 Ecological Soil Screening Levels for Cobalt	SSL NOAEL, no adjustment	7.33	---	--
Cobalt	M	Vole, Shrew, Weasel	LOAEL	--	C	Geometric mean for reproduction and growth	---	19.00		---	--	From SSL Document	19
Cobalt	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for growth	---	7.61		SSL NOAEL, no adjustment	7.61	--	--
Cobalt	A	Dove, Woodcock and Hawk	LOAEL	--	C	Geometric mean for growth	---	18.30		---	--	From SSL Document	18.3
Copper	M	Pig	NOAEL	---	C	Growth endpoint	---	5.60	U.S. EPA 2007 Ecological Soil Screening Levels for Copper	SSL NOAEL, no adjustment	5.6	--	--
Copper	M	Pig	LOAEL	---	C	Growth endpoint	---	9.34		---	--	From SSL Document	9.34
Copper	A	Chicken	NOAEL	---	C	Reproduction Endpoint	---	4.05		SSL NOAEL, no adjustment	4.05	--	--
Copper	A	Chicken	LOAEL	---	C	Reproduction Endpoint	---	12.10		---	--	From SSL Document	12.1
Cyanide	M	Rat	NOAEL	Days 1-16 of gestation	C	Developmental (decrease growth in pups)	diet	68.7	Sample et al. 1996 (Tewe and Maner 1981)	No adjustment	68.7	NOAEL adjusted by 10	687
Cyanide	A	Chicken (chicks)	LOAEL	20 days	S	Depressed growth and food intake	135 mg HCN/kg-diet / 130 mg CN/kg-diet	13	Eisler 1991 (Elzubier and Davis 1988)	Adjusted by 20	0.65	Adjusted by 4	3.25
Cyclohexane		Use Benzene as surrogate											
DDT and Metabolites	A	Chicken	NOAEL	---	C	Growth endpoint	---	0.227	U.S. EPA 2007 Soil Screening Level for DDT and Metabolites	SSL NOAEL, no adjustment	0.227	---	--
DDT and Metabolites	A	Chicken	LOAEL	---	C	Growth endpoint	---	2.270		---	--	From SSL Document	2.27
DDT and Metabolites	M	Rat	NOAEL	---	C	Growth endpoint	---	0.147		SSL NOAEL, no adjustment	0.147	---	--
DDT and Metabolites	M	Rat	LOAEL	---	C	Growth endpoint		0.735		---	--	From SSL Document	0.735
Dibenzofuran	M	Rat	LOAEL	103 weeks	C	Decreased survival after 1.5 years	2,3-Benzofuran	30	NTP 1989	Adjusted by 5	6	No adjustment	30
Dibenzofuran	A	Red-winged Blackbird	LD ₅₀	Single dose	A	Mortality	gavage	102	Schafer et al. 1983	Adjusted by 100	1.02	Adjusted by 20	5.1
Dieldrin	M	Rat	NOAEL	---	C	Reproduction Endpoint	---	0.015	U.S. EPA 2007 Soil Screening Levels for Dieldrin	SSL NOAEL, no adjustment	0.015	---	--
Dieldrin	M	Rat	LOAEL	---	C	Reproduction Endpoint	---	0.030		---	--	From SSL Document	0.03
Dieldrin	A	Mallard	NOAEL	---	C	Growth endpoint	---	0.071		SSL NOAEL, no adjustment	0.071	---	--
Dieldrin	A	Mallard	LOAEL	---	C	Growth endpoint	---	3.780		---	--	From SSL Document	3.78
Di-n-butyl phthalate	M	Rat	LOAEL	52 weeks	C	Survival	diet	625	ATSDR 1990 (Smith 1953)	--	--	No adjustment	625
Di-n-butyl phthalate	M	Rat	NOAEL	52 weeks	C	Survival	diet	125		No adjustment	125	--	--
Di-n-butyl phthalate	A	Ringed Dove	LOAEL	4 weeks (breeding)	C	Decreased eggshell thickness, increased water permeability	diet	1.12	Sample et al. 1996 (Peakall 1974)	Adjusted by 5	0.224	No adjustment	1.12
Di-n-octyl phthalate	M	Mouse	LOAEL	Days 6-13 of gestation	C	Developmental (reduced liveborn per litter)	---	9780	ATSDR 1997 (Hardin et al. 1987)	Adjusted by 5	1956	No adjustment	9780
Endosulfan (alpha-, beta-, and sulfate)	M	Rat	LOAEL	11 weeks	C	Increased pup mortality	diet	8	ATSDR 2000 (Hoechst 1982)	--	--	No adjustment	8
Endosulfan (alpha-, beta-, and sulfate)	M	Rat	NOAEL	11 weeks	C	Developmental	diet	4		No adjustment	4	--	--
Endosulfan (alpha-, beta-, and sulfate)	A	Mallard 7 days old	LD ₅₀	acute	A	Mortality	---	6.47	Hudson et al. 1984	Adjusted by 100	0.0647	Adjusted by 20	0.324

Table D-2. Toxicity Reference Values

COPC	Spec	Test Species	Endpoint	Duration	Code	Effect	Administration	Dose (mg/kg-BW/day)	Reference	Dose Adjustment for NOAEL TRV	SLERA NOAEL	Dose Adjustment for LOAEL TRV	SLERA LOAEL
Endrin and Endrin Aldehyde	M	Mouse	LOAEL	120 days	C	Reproductive (reduced litter size)	food	0.65	ATSDR 1996 (Good and Ware 1969)	Adjusted by 10	0.065	--	0.65
Endrin and Endrin Aldehyde	A	Screech Owl	LOAEL	>83 days	C	Reproduction (reduction in egg production and hatching success)	oral in diet	0.1035	Sample et al. 1996 (Fleming et al. 1982)	Adjusted by 10	0.01035	--	0.1035
Heptachlor	M	Mink	LOAEL	181 days	C	Reproduction (23% and 19% reduction in kit weight)	oral in diet	1	Sample et al. 1996 (Crum et al. 1993)	Adjusted by 10	0.1	--	1
Heptachlor	A	Japanese quail (14-days old)	LOAEL	5 days	A	Mortality (93%)	141 mg/kg-diet	101	Hill and Camardese 1986	--	--	Adjusted by 10	10.1
Heptachlor	A	Japanese quail (14-days old)	NOAEL	5 days	A	Mortality (7%)	50 mg/kg-diet	50.9		Adjusted by 30	1.69	--	--
Heptachlor epoxide	M	Rat	LOAEL	3 generations	C	Reproduction (Pup survival)	---	0.5		--	--	No adjustment	0.5
Heptachlor epoxide	M	Rat	NOAEL	3 generations	C	Reproduction	---	0.25	IRIS 2005 (Dow 1959)	No adjustment	0.25	--	--
Lead	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	4.7		SSL NOAEL, no adjustment	4.7	--	--
Lead	M	Rat	LOAEL	--	C	Reproduction	---	8.9	U.S. EPA 2005 Soil Screening Levels for Lead	--	--	From SSL Document	8.9
Lead	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for reproduction and growth	---	1.63		SSL NOAEL, no adjustment	1.63	--	--
Lead	A	Chicken	LOAEL	---	C	Reproduction	---	3.26		--	--	From SSL Document	3.26
Manganese	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	51.5		SSL NOAEL, no adjustment	51.5	--	--
Manganese	M	Vole, Shrew, Weasel	LOAEL	---	C	Geometric mean for reproduction and growth	---	145.7	U.S. EPA 2007 Soil Screening Levels for Manganese	--	--	From SSL Document	145.7
Manganese	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for reproduction and growth	---	179		SSL NOAEL, no adjustment	179	--	--
Manganese	A	Dove, Woodcock and Hawk	LOAEL	---	C	Geometric mean for reproduction and growth	---	376		--	--	From SSL Document	376
Mercury (inorganic)	M	Rat (Fischer 344)	LOAEL	2 years, 5 d/wk, 1x/d	C	Body Weight (24% decrease in male bw gain, 16% decrease in female bw gain) & Mortality (increased in males)	gavage with water	1.9	ATSDR 1999 (NTP 1993)	Adjusted by 5	0.38	No adjustment	1.9
Mercury (inorganic)	A	Japanese Quail	LOAEL	1 yr	C	Fertility and hatchability decreased	8 mg Hg/kg-food	0.9	Sample et al. 1996 (Hill and Schaffner 1976)	--	--	No adjustment	0.9
Mercury (inorganic)	A	Japanese Quail	NOAEL	1 yr	C	No adverse effects	in diet	0.45		No adjustment	0.45	--	--
Methoxychlor	M	Rat	NOAEL	11 months	C	Reproduction	---	4	Sample et al. 1996 (Gray et al. 1988)	No adjustment	4	--	--
Methoxychlor	M	Rat	LOAEL	11 months	C	Reproduction	---	8		--	--	No adjustment	8
Methoxychlor	A	California Quail	LD50	10 months	C	Mortality	---	>2000		Hudson et al. 1984	Adjusted by 100	20	Adjusted by 20
Methylcyclohexane			Use Benzene as surrogate										
Nickel	M	Mouse	NOAEL	--	C	Reproduction Endpoint	---	1.70	U.S. EPA 2007 Soil Screening Levels for Nickel	SSL NOAEL, no adjustment	1.7	--	--
Nickel	M	Mouse	LOAEL	--	C	Reproduction Endpoint	---	3.40		--	--	From SSL Document	3.4
Nickel	A	Dove, Woodcock and Hawk	NOAEL	--	C	Geometric mean for reproduction and growth	---	6.71		SSL NOAEL, no adjustment	6.71	--	--
Nickel	A	Dove, Woodcock and Hawk	LOAEL	--	C	Geometric mean for reproduction and growth	---	18.56		--	--	From SSL Document	18.56
PAHs, Total High Molecular Weight	M	Mouse	NOAEL	--	C	Survival endpoint, benzo(a)pyrene	---	0.615	U.S. EPA 2007 Soil Screening Level for PAHs	SSL NOAEL, no adjustment	0.615	--	--
PAHs, Total High Molecular Weight	M	Mouse	LOAEL	--	C	Survival endpoint, benzo(a)pyrene	---	3.070		--	--	From SSL Document	3.07
PAHs, Total High Molecular Weight (7,12-Dimethylbenz(a)anthracene)	A	European Starling (juvenile)	NOAEL	5 days	S	Growth	---	2.0	U.S. EPA 2007 Soil Screening Level for PAHs (Trust 1994)	Adjustment in SSL document for subchronic duration	2	--	--
PAHs, Total High Molecular Weight (7,12-Dimethylbenz(a)anthracene)	A	European Starling (juvenile)	LOAEL	5 days	S	Growth	---	20		--	--	Adjustment in SSL document for subchronic duration	20
PAHs, Total Low Molecular Weight	M	Rat	NOAEL	--	C	Growth endpoint, 1-naphthalenacetic acid	---	65.6	U.S. EPA 2007 Soil Screening Level	SSL NOAEL, no adjustment	65	--	--

Table D-2. Toxicity Reference Values

COPC	Spec	Test Species	Endpoint	Duration	Code	Effect	Administration	Dose (mg/kg-BW/day)	Reference	Dose Adjustment for NOAEL TRV	SLERA NOAEL	Dose Adjustment for LOAEL TRV	SLERA LOAEL	
PAHs, Total Low Molecular Weight	M	Rat	LOAEL	---	C	Growth endpoint, 1-naphthalenacetic acid	---	328.0	for PAHs	---	--	From SSL Document	328	
PAHs, Total Low Molecular Weight (Naphthalene)	A	Bobwhite Quail (juvenile)	NOAEL	5 days	S	Mortality and Growth	---	1,653	U.S. EPA Soil Screening Level for PAHs 2007 (Landis Assoc. Inc 1985)	Adjustment in SSL document for subchronic duration	1653	16530		
PCBs, Total	M	Mink	LOAEL	21 weeks	C	Decreased reproduction rates and litter size (serious effect)	in food	0.9	ATSDR 2000 (Aulerich and Ringer 1977)	--	--	No adjustment	0.9	
PCBs, Total	M	Mink	NOAEL	21 weeks	C	Reproduction	in food	0.2		No adjustment	0.2	--	--	
PCBs, Total	A	Ring-necked Pheasant	LOAEL	17 weeks	C	Reproduction (reduced egg hatchability)	12.5 mg/bird/week orally via gelatin capsule	2	Sample et al. 1996 (Dahlgren et al. 1972)	Adjusted by 5	0.4	No adjustment	2	
Pentachlorophenol	M	Rat	NOAEL	6-15 days of gestation	C	Development	gavage in oil	5	ATSDR 2001 (Schwartz et al 1974)	No adjustment	5	---	---	
Pentachlorophenol	M	Rat	LOAEL		C			16		---	---	No adjustment	16	
Pentachlorophenol	A	Chicken	NOAEL	8 weeks	C	Decreased Body Weight	1200 mg/kg in food	44	Prescott et al 1982	No adjustment	44	--	--	
Pentachlorophenol	A	Chicken	LOAEL	8 weeks	C	Growth	600 mg/kg in food	87		--	--	No adjustment	87	
Phenol	M	Rat	NOAEL	6 weeks	C	Reproduction - offspring weight	ad libitum water		TCEQ Database	No adjustment	101	---	---	
Phenol	M	Rat	LOAEL	6 weeks	C	Reproduction - offspring weight	ad libitum water			---	---	No adjustment	386	
Selenium	M	Pig	NOAEL	---	C	Growth endpoint	---	0.143	U.S. EPA 2007 Soil Screening Level for Selenium	SSL NOAEL, no adjustment	0.143	---	--	
Selenium	M	Pig	LOAEL	---	C	Growth endpoint	---	0.215		---	--	From SSL Document	0.215	
Selenium	A	Chicken	NOAEL	---	C	Survival endpoint	---	0.29		SSL NOAEL, no adjustment	0.29	---	--	
Selenium	A	Chicken	LOAEL	---	C	Survival endpoint	---	0.579		---	--	From SSL Document	0.597	
Silver	M	Pig	NOAEL	---	C	Growth endpoint	---	6.02	U.S. EPA 2006 Soil Screening Level for Silver	SSL NOAEL, no adjustment	6.02	---	--	
Silver	M	Pig	LOAEL	---	C	Growth endpoint	---	60.2		---	--	From SSL Document	60.2	
Silver	A	Turkey	NOAEL	---	C	Growth endpoint	---	2.02		SSL NOAEL, no adjustment	20.2	---	--	
Silver	A	Turkey	LOAEL	---	C	Growth endpoint	---	20.2		---	--	From SSL Document	20.2	
Vanadium	A	Chicken	NOAEL	4 weeks	C	Reproduction - Egg quality	3 doses in diet	0.988	TCEQ Database	No adjustment	0.988	--	--	
Vanadium	A	Chicken	LOAEL	4 weeks	C	Reproduction - Egg quality	3 doses in diet	1.98		--	--	No adjustment	1.98	
Vanadium	M	Rat	NOAEL	3 weeks	C	Growth-body weight changes	4 doses gavage	3.43		No adjustment	3.43	--	--	
Vanadium	M	Rat	LOAEL	3 weeks	C	Growth-body weight changes	4 doses gavage	6.85		--	--	No adjustment	6.85	
Zinc	M	Vole, Shrew, Weasel	NOAEL	---	C	Geometric mean for reproduction and growth	---	75.4	U.S. EPA 2007 Soil Screening Level for Zinc	SSL NOAEL, no adjustment	75.4	---	--	
Zinc	M	Vole, Shrew, Weasel	LOAEL	---	C	Geometric mean for reproduction and growth	---	297.6		---	--	From SSL Document	297.6	
Zinc	A	Dove, Woodcock and Hawk	NOAEL	---	C	Geometric mean for reproduction and growth	---	66.1		SSL NOAEL, no adjustment	66.1	---	--	
Zinc	A	Dove, Woodcock and Hawk	LOAEL	---	C	Geometric mean for reproduction and growth	---	171.4		---	--	From SSL Document	171.4	

Species - M = Mammal, A = Avian Exposure Duration Code - C = Chronic, S = Subchronic, A = Acute

Appendix D-2 TRV References

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Table D-3. Toxicity Reference Values

Analyte	CAS No.	Avian NOAEL TRV (mg/kg-day)	Avian LOAEL TRV (mg/kg-day)	Mammal NOAEL TRV (mg/kg-day)	Mammal LOAEL TRV (mg/kg-day)	TRV Notes
Aluminum	7429-90-5	2.50E+01	1.25E+02	1.80E+01	8.80E+01	
Arsenic	7440-38-2	2.24E+00	1.73E+01	1.04E+00	1.66E+00	
Barium	7440-39-3	4.16E+01	2.08E+02	5.20E+01	8.27E+01	
Cadmium	7440-43-9	1.47E+00	6.35E+00	7.70E-01	7.70E+00	
Chromium	7440-47-3	2.66E+00	1.56E+01	2.40E+00	5.82E+01	
Cobalt	7440-48-4	7.61E+00	1.83E+01	7.33E+00	1.90E+01	
Copper	7440-50-8	4.05E+00	1.21E+01	5.60E+00	9.34E+00	
Lead	7439-92-1	1.63E+00	3.26E+00	4.70E+00	8.90E+00	
Manganese	7439-96-5	1.79E+02	3.76E+02	5.15E+01	1.46E+02	
Mercury	7439-97-6	4.50E-01	9.00E-01	3.80E-01	1.90E+00	
Nickel	7440-02-0	6.71E+00	1.86E+01	1.70E+00	3.40E+00	
Selenium	7782-49-2	2.90E-01	5.79E-01	1.43E-01	2.15E-01	
Silver	7440-22-4	2.02E+00	2.02E+01	6.02E+00	6.02E+01	
Vanadium	7440-62-2	9.88E-01	1.98E+00	3.43E+00	6.85E+00	TRVs from TCEQ Database
Zinc	7440-66-6	6.61E+01	1.71E+02	7.54E+01	2.98E+02	
Cyanide	57-12-5	6.53E-01	3.26E+00	6.87E+01	6.87E+02	
2-Chloronaphthalene	91-58-7	1.65E+03	1.65E+04	6.56E+01	3.28E+02	Low MW PAHs as surrogate
4,4'-DDD	72-54-8	2.27E-01	2.27E+00	1.47E-01	7.35E-01	Values for DDT and metabolites
4,4'-DDE	72-55-9	2.27E-01	2.27E+00	1.47E-01	7.35E-01	Values for DDT and metabolites
4,4'-DDT	50-29-3	2.27E-01	2.27E+00	1.47E-01	7.35E-01	Values for DDT and metabolites
Acetophenone	98-86-2	2.24E-01	1.12E+00	1.25E+02	6.25E+02	di-n-butyl phthalate used as surrogate
Aldrin	309-00-2	7.10E-02	3.78E+00	1.50E-02	3.00E-02	Dieldrin used as surrogate
alpha-BHC	319-84-6	4.00E+00	2.00E+01	8.00E+00	5.60E+01	gamma-BHC used as surrogate for birds
beta-BHC	319-85-7	4.00E+00	2.00E+01	4.00E+00	2.00E+01	gamma-BHC used as surrogate for birds
delta-BHC	319-86-8	4.00E+00	2.00E+01	4.00E+00	2.00E+01	used beta -BHC as surrogate for mammals and gamma-BHC used as surrogate for birds
gamma-BHC (Lindane)	58-89-9	4.00E+00	2.00E+01	5.00E+00	1.00E+01	
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	2.00E+00	2.90E+00	technical chlordane used as surrogate for bird tox data
gamma-Chlordane	5103-74-2	2.14E+00	1.07E+01	2.40E+00	4.90E+00	technical chlordane used as surrogate for mammal and bird tox data
Carbazole	86-74-8	1.65E+03	1.65E+04	6.56E+01	3.28E+02	Low MW PAHs as surrogate
Cyclohexane	110-82-7	No TRV	No TRV	5.00E+01	1.00E+02	Benzene used as surrogate
2,4-Dimethylphenol	105-67-9	No TRV	No TRV	1.01E+02	3.86E+02	Phenol used as surrogate - TRVs from TCEQ Database
Dieldrin	60-57-1	7.10E-02	3.78E+00	1.50E-02	3.00E-02	
Endosulfan I	959-98-9	6.47E-02	3.24E-01	4.00E+00	8.00E+00	Values for Endosulfan (alpha-, beta-, and sulfate)
Endosulfan sulfate	1031-07-8	6.47E-02	3.24E-01	4.00E+00	8.00E+00	Values for Endosulfan (alpha-, beta-, and sulfate)
Endrin	72-20-8	1.04E-01	1.04E+00	6.50E-02	6.50E-01	Values for endrin and endrin aldehyde
Endrin aldehyde	7421-93-4	1.04E-01	1.04E+00	6.50E-02	6.50E-01	Values for endrin and endrin aldehyde
Endrin ketone	53494-70-5	1.04E-01	1.04E+00	6.50E-02	6.50E-01	Endrin and Endrin aldehyde used as surrogate
Heptachlor	76-44-8	1.70E+00	1.01E+01	1.00E-01	1.00E+00	
Heptachlor epoxide	1024-57-3	1.70E+00	1.01E+01	2.50E-01	5.00E-01	Heptachlor used as surrogate for bird tox data
Methoxychlor	72-43-5	2.00E+01	1.00E+02	4.00E+00	8.00E+00	
Methylcyclohexane	108-87-2	No TRV	No TRV	5.00E+01	1.00E+02	Benzene used as surrogate
Total PCBs	TPCB	4.00E-01	2.00E+00	2.00E-01	9.00E-01	
Benzaldehyde	100-52-7	No TRV	No TRV	5.00E+01	1.00E+02	Benzene used as surrogate
Bis(2-ethylhexyl)phthalate	117-81-7	3.48E-01	8.75E+00	4.40E+01	9.10E+01	

Table D-3. Toxicity Reference Values

Analyte	CAS No.	Avian NOAEL TRV (mg/kg-day)	Avian LOAEL TRV (mg/kg-day)	Mammal NOAEL TRV (mg/kg-day)	Mammal LOAEL TRV (mg/kg-day)	TRV Notes
Carbon disulfide	75-15-0	No TRV	No TRV	1.00E+02	2.00E+02	
Dibenzofuran	132-64-9	1.02E+00	5.10E+00	6.00E+00	3.00E+01	
Butylbenzylphthalate	85-68-7	3.48E-01	8.75E+00	8.15E+02	1.22E+03	Bis(2-ethylhexyl)phthalate used as surrogate for birds
Di-n-butyl phthalate	84-74-2	2.24E-01	1.12E+00	1.25E+02	6.25E+02	
Di-n-octyl phthalate	117-84-0	3.48E-01	8.75E+00	1.96E+03	9.78E+03	Bis(2-ethylhexyl)phthalate used as surrogate for birds
Pentachlorophenol	87-86-5	4.40E+01	8.70E+01	5.00E+00	1.60E+01	
Low Molecular Weight PAHs	LPAH	1.65E+03	1.65E+04	6.56E+01	3.28E+02	
High Molecular Weight PAHs	HPAH	2.00E+00	2.00E+01	6.15E-01	3.07E+00	
Total PAHs	TPAH	2.00E+00	2.00E+01	6.15E-01	3.07E+00	Used High MW PAHs as surrogate for birds and mammals

Appendix E-1 – Conservative Risk Assessment Calculations

South Pit Soils
SLERA HQ Calculations
Conservative Analysis
EPC = maximum detected concentration
AUF = 1
NOAEL-based HQs

South Pit Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus</i> Linneaus	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	3.16E-01	j	NA	2.8	d	8.86E-03	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. <i>Physiol. Zool.</i> 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Petersen et al. 1998, food ingestion assumed to be 14% of body weight per day. (2.26 kg x 0.14 = 0.316 kg/day)										

South Pit Soil
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Percent of Components in Receptor Diet			
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

Habitat Type: Document Type: Location: Risk from which Medium: Surface Water Data:	Terrestrial			
	SLERA			
Soil (Conservative HQs)				
Surface Water Data from North Portion of East Ditch				
COPCs	Maximum Surface Water Conc. (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)
Barium	6.39E-01	1.18E+03	2.22E+03	2.22E+03
Cadmium	8.00E-04	6.99E+00	1.96E+01	1.96E+01
Chromium	6.41E-04	1.78E+02	2.34E+02	2.34E+02
Copper	3.44E-03	1.05E+02	2.34E+02	2.34E+02
Lead	2.38E-03	2.77E+02	3.59E+02	3.59E+02
Manganese	2.70E+00	4.90E+02	4.83E+02	4.90E+02
Nickel	1.22E-02	1.36E+01	6.01E+01	6.01E+01
Selenium	4.76E-03	1.70E+00	3.77E+00	3.77E+00
Silver	3.50E-03	6.11E-01	1.60E+00	1.60E+00
Vanadium	7.35E-03	2.05E+01	2.77E+01	2.77E+01
Zinc	5.42E-02	2.70E+03	2.12E+03	2.70E+03
Mercury	7.40E-05	1.98E+00	2.30E+01	2.30E+01
4,4'-DDD	5.60E-06	1.10E-01	8.60E-02	1.10E-01
4,4'-DDE	1.00E-05	3.30E-02	ND	3.30E-02
4,4'-DDT	4.80E+01	3.40E-02	8.80E-02	8.80E-02
alpha-Chlordane	7.50E-06	1.40E-02	2.50E-01	2.50E-01
beta-BHC	6.10E-05	2.30E-01	6.30E-02	2.30E-01
Dieldrin	2.50E-05	5.70E-02	2.50E-02	5.70E-02
Endrin	2.50E-05	2.20E-02	3.80E-02	3.80E-02
Endrin aldehyde	1.40E-05	1.00E-01	2.80E-02	1.00E-01
gamma-BHC (Lindane)	6.20E-06	1.30E-02	ND	1.30E-02
gamma-chlordane	3.90E-06	2.10E-01	3.10E-01	3.10E-01
Heptachlor	1.40E-05	ND	6.90E-02	6.90E-02
Heptachlor epoxide	1.60E-05	1.70E-02	3.30E-01	3.30E-01
Total PCBs	2.00E-04	3.68E-01	7.78E-01	7.78E-01
2,4-Dimethylphenol	8.00E-05	ND	1.90E-01	1.90E-01
Benzaldehyde	5.00E-05	7.60E-03	1.30E+00	1.30E+00
Carbazole	5.00E-05	1.90E-02	4.50E-01	4.50E-01
Dibenzofuran	5.00E-05	7.50E-02	1.90E-01	1.90E-01
High Molecular Weight PAHs	4.97E-04	1.05E+00	2.95E+01	2.95E+01
Cyanide	4.00E-03	6.95E+00	2.34E+00	6.95E+00
Maximum detection limit in surface water used as surface water concentration if COPC not detected.				

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Conservative HQs) Red-tailed Hawk							
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	5.7E-02	6.7E+01	5.8E+00	2.1E+01	2.8E-01
Cadmium	8.0E-04	7.0E+00	5.2E-01	3.6E+00	2.2E-01	1.5E+00	1.5E-01
Chromium	6.4E-04	1.8E+02	8.5E-02	1.5E+01	1.2E+00	2.7E+00	4.4E-01
Copper	3.4E-03	1.1E+02	2.4E-01	2.5E+01	1.6E+00	4.1E+00	4.0E-01
Lead	2.4E-03	2.8E+02	7.4E-02	2.0E+01	1.6E+00	1.6E+00	1.0E+00
Manganese	2.7E+00	4.9E+02	2.1E-02	1.0E+01	1.5E+00	1.8E+02	8.6E-03
Nickel	1.2E-02	1.4E+01	1.1E-01	1.5E+00	1.1E-01	6.7E+00	1.7E-02
Selenium	4.8E-03	1.7E+00	5.2E-01	8.9E-01	5.4E-02	2.9E-01	1.9E-01
Silver	3.50E-03	6.1E-01	4.0E-03	2.4E-03	1.4E-03	2.0E+00	6.7E-04
Vanadium	7.35E-03	2.1E+01	1.2E-02	2.5E-01	4.9E-02	9.9E-01	4.9E-02
Zinc	5.42E-02	2.7E+03	5.7E-01	1.5E+03	9.3E+01	6.6E+01	1.4E+00
Mercury	7.40E-05	2.0E+00	5.4E-02	1.1E-01	9.4E-03	4.5E-01	2.1E-02
4,4'-DDD	5.60E-06	1.1E-01	1.8E+00	2.0E-01	1.2E-02	2.3E-01	5.1E-02
4,4'-DDE	1.00E-05	3.3E-02	2.0E+00	6.7E-02	3.9E-03	2.3E-01	1.7E-02
4,4'-DDT	4.80E+01	3.4E-02	2.0E+00	6.9E-02	2.9E+00	2.3E-01	1.3E+01
alpha-Chlordane	7.50E-06	1.4E-02	1.5E+00	2.0E-02	1.2E-03	2.1E+00	5.6E-04
beta-BHC	6.10E-05	2.3E-01	1.5E+00	3.4E-01	2.0E-02	4.0E+00	4.9E-03
Dieldrin	2.50E-05	5.7E-02	4.4E+00	2.5E-01	1.4E-02	7.1E-02	2.0E-01
Endrin	2.50E-05	2.2E-02	4.9E+00	1.1E-01	6.3E-03	1.0E-01	6.0E-02
Endrin aldehyde	1.40E-05	1.0E-01	1.5E+00	1.5E-01	8.5E-03	1.0E-01	8.3E-02
gamma-BHC (Lindane)	6.20E-06	1.3E-02	1.5E+00	1.9E-02	1.1E-03	4.0E+00	2.8E-04
gamma-chlordane	3.90E-06	2.1E-01	1.5E+00	3.1E-01	1.8E-02	2.1E+00	8.4E-03
Heptachlor	1.40E-05	Not detected in surface soil					
Heptachlor epoxide	1.60E-05	1.7E-02	1.5E+00	2.5E-02	1.5E-03	1.7E+00	8.6E-04
Total PCBs	2.00E-04	3.7E-01	1.9E-01	7.0E-02	4.6E-03	4.0E-01	1.2E-02
2,4-Dimethylphenol	8.00E-05	Not detected in surface soil					
Benzaldehyde	5.00E-05	7.6E-03	1.0E+00	7.6E-03	4.5E-04	No TRV	No TRV
Carbazole	5.00E-05	1.9E-02	1.0E-06	1.9E-08	3.4E-05	1.7E+03	2.1E-08
Dibenzofuran	5.00E-05	7.5E-02	1.5E+00	1.1E-01	6.4E-03	1.0E+00	6.3E-03
High Molecular Weight PAHs	4.97E-04	1.1E+00	1.0E-05	1.1E-05	1.8E-03	2.0E+00	8.8E-04
Cyanide	4.00E-03	7.0E+00	4.1E-02	2.8E-01	2.8E-02	6.5E-01	4.3E-02
Hawk consumes 100% terrestrial mammals in model. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW							

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South Pit Soil (Conservative HQs) American Robin									
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	9.10E-02	1.07E+02	1.6E-01	1.8E+02	3.0E+01	2.08E+01	1.42E+00
Cadmium	8.0E-04	7.0E+00	7.71E+00	5.39E+01	5.9E-01	4.1E+00	4.18E+00	1.47E+00	2.84E+00
Chromium	6.4E-04	1.8E+02	3.06E-01	5.45E+01	4.1E-02	7.3E+00	5.71E+00	2.66E+00	2.15E+00
Copper	3.4E-03	1.1E+02	5.15E-01	5.41E+01	1.2E-01	1.3E+01	5.55E+00	4.05E+00	1.37E+00
Lead	2.4E-03	2.8E+02	3.89E-02	1.08E+01	2.7E-01	7.4E+01	8.06E+00	1.63E+00	4.94E+00
Manganese	2.7E+00	4.9E+02	5.40E-02	2.65E+01	7.9E-02	3.9E+01	8.65E+00	1.79E+02	4.83E-02
Nickel	1.2E-02	1.4E+01	1.06E+00	1.44E+01	1.8E-02	2.4E-01	1.14E+00	6.71E+00	1.71E-01
Selenium	4.8E-03	1.7E+00	9.85E-01	1.67E+00	6.7E-01	1.1E+00	2.14E-01	2.90E-01	7.37E-01
Silver	3.5E-03	6.1E-01	2.05E+00	1.25E+00	1.4E-02	8.6E-03	9.45E-02	2.02E+00	4.68E-02
Vanadium	7.4E-03	2.1E+01	4.20E-02	8.61E-01	4.9E-03	9.9E-02	2.21E-01	9.88E-01	2.24E-01
Zinc	5.4E-02	2.7E+03	3.20E+00	8.64E+03	3.7E-01	9.9E+02	7.05E+02	6.61E+01	1.07E+01
Mercury	7.4E-05	2.0E+00	1.69E+00	3.35E+00	6.5E-01	1.3E+00	3.45E-01	4.50E-01	7.67E-01
4,4'-DDD	5.6E-06	1.1E-01	3.24E+00	3.56E-01	1.8E-01	1.9E-02	2.76E-02	2.27E-01	1.21E-01
4,4'-DDE	1.0E-05	3.3E-02	9.95E+00	3.28E-01	6.2E-02	2.0E-03	2.38E-02	2.27E-01	1.05E-01
4,4'-DDT	4.8E+01	3.4E-02	9.95E+00	3.38E-01	6.2E-02	2.1E-03	6.86E+00	2.27E-01	3.02E+01
alpha-Chlordane	7.5E-06	1.4E-02	2.87E+01	4.02E-01	1.6E-01	2.2E-03	2.89E-02	2.14E+00	1.35E-02
beta-BHC	6.1E-05	2.3E-01	3.00E-01	6.90E-02	2.0E-03	4.5E-04	6.65E-03	4.00E+00	1.66E-03
Dieldrin	2.5E-05	5.7E-02	1.67E+01	9.52E-01	3.9E-01	2.2E-02	6.97E-02	7.10E-02	9.82E-01
Endrin	2.5E-05	2.2E-02	3.69E+01	8.12E-01	5.8E-03	1.3E-04	5.79E-02	1.04E-01	5.60E-01
Endrin aldehyde	1.4E-05	1.0E-01	4.70E+00	4.70E-01	6.8E-01	6.8E-02	3.90E-02	1.04E-01	3.77E-01
gamma-BHC (Lindane)	6.2E-06	1.3E-02	2.92E+00	3.80E-02	2.0E-03	2.5E-05	2.80E-03	4.00E+00	7.00E-04
gamma-chlordane	3.9E-06	2.1E-01	2.87E+01	6.03E+00	1.6E-01	3.4E-02	4.33E-01	2.14E+00	2.02E-01
Heptachlor	1.4E-05	Not detected in surface soil							
Heptachlor epoxide	1.6E-05	1.7E-02	1.05E+01	1.79E-01	2.4E+00	4.1E-02	1.58E-02	1.70E+00	9.28E-03
Total PCBs	2.0E-04	3.7E-01	2.80E-01	1.03E-01	1.7E-01	6.2E-02	1.45E-02	4.00E-01	3.62E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil							
Benzaldehyde	5.0E-05	7.6E-03	1.00E+00	7.60E-03	2.6E+00	2.0E-02	2.00E-03	No TRV	No TRV
Carbazole	5.0E-05	1.9E-02	2.31E+00	4.39E-02	1.2E+01	2.3E-01	1.98E-02	1.65E+03	1.20E-05
Dibenzofuran	5.0E-05	7.5E-02	5.72E+00	4.29E-01	1.3E+00	9.7E-02	3.80E-02	1.02E+00	3.72E-02
High Molecular Weight PAHs	5.0E-04	1.1E+00	1.77E+00	1.86E+00	3.4E-01	3.6E-01	1.66E-01	2.00E+00	8.29E-02
Cyanide	4.0E-03	7.0E+00	3.01E-01	2.09E+00	1.3E-01	9.0E-01	2.65E-01	6.53E-01	4.05E-01
Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW									

South Pit Soil - Conservative Analysis
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South Pit Soil (Conservative HQs) Mourning Dove							
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	1.6E-01	1.8E+02	3.6E+01	2.1E+01	1.7E+00
Cadmium	8.0E-04	7.0E+00	5.9E-01	4.1E+00	5.8E-01	1.5E+00	3.9E-01
Chromium	6.4E-04	1.8E+02	4.1E-02	7.3E+00	2.9E+00	2.7E+00	1.1E+00
Copper	3.4E-03	1.1E+02	1.2E-01	1.3E+01	2.8E+00	4.1E+00	6.8E-01
Lead	2.4E-03	2.8E+02	2.7E-01	7.4E+01	1.2E+01	1.6E+00	7.4E+00
Manganese	2.7E+00	4.9E+02	7.9E-02	3.9E+01	1.1E+01	1.8E+02	5.9E-02
Nickel	1.2E-02	1.4E+01	1.8E-02	2.4E-01	1.9E-01	6.7E+00	2.8E-02
Selenium	4.8E-03	1.7E+00	6.7E-01	1.1E+00	1.6E-01	2.9E-01	5.5E-01
Silver	3.5E-03	6.1E-01	1.4E-02	8.6E-03	8.4E-03	2.0E+00	4.2E-03
Vanadium	7.4E-03	2.1E+01	4.9E-03	9.9E-02	2.5E-01	9.9E-01	2.5E-01
Zinc	5.4E-02	2.7E+03	3.7E-01	9.9E+02	1.5E+02	6.6E+01	2.3E+00
Mercury	7.4E-05	2.0E+00	6.5E-01	1.3E+00	1.8E-01	4.5E-01	4.0E-01
4,4'-DDD	5.6E-06	1.1E-01	1.8E-01	1.9E-02	3.6E-03	2.3E-01	1.6E-02
4,4'-DDE	1.0E-05	3.3E-02	6.2E-02	2.0E-03	6.2E-04	2.3E-01	2.8E-03
4,4'-DDT	4.8E+01	3.4E-02	6.2E-02	2.1E-03	5.8E+00	2.3E-01	2.6E+01
alpha-Chlordane	7.5E-06	1.4E-02	1.6E-01	2.2E-03	4.3E-04	2.1E+00	2.0E-04
beta-BHC	6.1E-05	2.3E-01	2.0E-03	4.5E-04	2.7E-03	4.0E+00	6.7E-04
Dieldrin	2.5E-05	5.7E-02	3.9E-01	2.2E-02	3.3E-03	7.1E-02	4.7E-02
Endrin	2.5E-05	2.2E-02	5.8E-03	1.3E-04	2.7E-04	1.0E-01	2.6E-03
Endrin aldehyde	1.4E-05	1.0E-01	6.8E-01	6.8E-02	9.4E-03	1.0E-01	9.1E-02
gamma-BHC (Lindane)	6.2E-06	1.3E-02	2.0E-03	2.5E-05	1.5E-04	4.0E+00	3.8E-05
gamma-chlordane	3.9E-06	2.1E-01	1.6E-01	3.4E-02	6.5E-03	2.1E+00	3.0E-03
Heptachlor	1.4E-05	Not detected in surface soil					
Heptachlor epoxide	1.6E-05	1.7E-02	2.4E+00	4.1E-02	5.2E-03	1.7E+00	3.1E-03
Total PCBs	2.0E-04	3.7E-01	1.7E-01	6.2E-02	1.2E-02	4.0E-01	2.9E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil					
Benzaldehyde	5.0E-05	7.6E-03	2.6E+00	2.0E-02	2.5E-03	No TRV	No TRV
Carbazole	5.0E-05	1.9E-02	1.2E+01	2.3E-01	2.8E-02	1.7E+03	1.7E-05
Dibenzofuran	5.0E-05	7.5E-02	1.3E+00	9.7E-02	1.3E-02	1.0E+00	1.2E-02
High Molecular Weight PAHs	5.0E-04	1.1E+00	3.4E-01	3.6E-01	5.6E-02	2.0E+00	2.8E-02
Cyanide	4.0E-03	7.0E+00	1.3E-01	9.0E-01	1.9E-01	6.5E-01	2.9E-01
Mourning Dove consumes 100% terrestrial plants. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW							

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Conservative HQs) White Footed Mouse									
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	9.10E-02	1.07E+02	1.6E-01	1.8E+02	2.4E+01	5.20E+01	4.64E-01
Cadmium	8.0E-04	7.0E+00	7.71E+00	5.39E+01	5.9E-01	4.1E+00	4.13E+00	7.70E-01	5.37E+00
Chromium	6.4E-04	1.8E+02	3.06E-01	5.45E+01	4.1E-02	7.3E+00	4.89E+00	2.40E+00	2.04E+00
Copper	3.4E-03	1.1E+02	5.15E-01	5.41E+01	1.2E-01	1.3E+01	5.06E+00	5.60E+00	9.03E-01
Lead	2.4E-03	2.8E+02	3.89E-02	1.08E+01	2.7E-01	7.4E+01	6.78E+00	4.70E+00	1.44E+00
Manganese	2.7E+00	4.9E+02	5.40E-02	2.65E+01	7.9E-02	3.9E+01	6.42E+00	5.15E+01	1.25E-01
Nickel	1.2E-02	1.4E+01	1.06E+00	1.44E+01	1.8E-02	2.4E-01	1.08E+00	1.70E+00	6.35E-01
Selenium	4.8E-03	1.7E+00	9.85E-01	1.67E+00	6.7E-01	1.1E+00	2.05E-01	1.43E-01	1.44E+00
Silver	3.5E-03	6.1E-01	2.05E+00	1.25E+00	1.4E-02	8.6E-03	9.15E-02	6.02E+00	1.52E-02
Vanadium	7.4E-03	2.1E+01	4.20E-02	8.61E-01	4.9E-03	9.9E-02	1.27E-01	3.43E+00	3.71E-02
Zinc	5.4E-02	2.7E+03	3.20E+00	8.64E+03	3.7E-01	9.9E+02	6.91E+02	7.54E+01	9.16E+00
Mercury	7.4E-05	2.0E+00	1.69E+00	3.35E+00	6.5E-01	1.3E+00	3.35E-01	3.80E-01	8.82E-01
4,4'-DDD	5.6E-06	1.1E-01	3.24E+00	3.56E-01	1.8E-01	1.9E-02	2.70E-02	1.47E-01	1.84E-01
4,4'-DDE	1.0E-05	3.3E-02	9.95E+00	3.28E-01	6.2E-02	2.0E-03	2.35E-02	1.47E-01	1.60E-01
4,4'-DDT	4.8E+01	3.4E-02	9.95E+00	3.38E-01	6.2E-02	2.1E-03	7.16E+00	1.47E-01	4.87E+01
alpha-Chlordane	7.5E-06	1.4E-02	2.87E+01	4.02E-01	1.6E-01	2.2E-03	2.87E-02	2.00E+00	1.44E-02
beta-BHC	6.1E-05	2.3E-01	3.00E-01	6.90E-02	2.0E-03	4.5E-04	5.59E-03	4.00E+00	1.40E-03
Dieldrin	2.5E-05	5.7E-02	1.67E+01	9.52E-01	3.9E-01	2.2E-02	6.93E-02	1.50E-02	4.62E+00
Endrin	2.5E-05	2.2E-02	3.69E+01	8.12E-01	5.8E-03	1.3E-04	5.77E-02	6.50E-02	8.87E-01
Endrin aldehyde	1.4E-05	1.0E-01	4.70E+00	4.70E-01	6.8E-01	6.8E-02	3.85E-02	6.50E-02	5.92E-01
gamma-BHC (Lindane)	6.2E-06	1.3E-02	2.92E+00	3.80E-02	2.0E-03	2.5E-05	2.73E-03	5.00E+00	5.47E-04
gamma-chlordane	3.9E-06	2.1E-01	2.87E+01	6.03E+00	1.6E-01	3.4E-02	4.31E-01	2.40E+00	1.79E-01
Heptachlor	1.4E-05	Not detected in surface soil							
Heptachlor epoxide	1.6E-05	1.7E-02	1.05E+01	1.79E-01	2.4E+00	4.1E-02	1.57E-02	2.50E-01	6.26E-02
Total PCBs	2.0E-04	3.7E-01	2.80E-01	1.03E-01	1.7E-01	6.2E-02	1.28E-02	2.00E-01	6.39E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil							
Benzaldehyde	5.0E-05	7.6E-03	1.00E+00	7.60E-03	2.6E+00	2.0E-02	1.96E-03	5.00E+01	3.93E-05
Carbazole	5.0E-05	1.9E-02	2.31E+00	4.39E-02	1.2E+01	2.3E-01	1.96E-02	6.56E+01	2.99E-04
Dibenzofuran	5.0E-05	7.5E-02	5.72E+00	4.29E-01	1.3E+00	9.7E-02	3.75E-02	6.00E+00	6.25E-03
High Molecular Weight PAHs	5.0E-04	1.1E+00	1.77E+00	1.86E+00	3.4E-01	3.6E-01	1.61E-01	6.15E-01	2.61E-01
Cyanide	4.0E-03	7.0E+00	3.01E-01	2.09E+00	1.3E-01	9.0E-01	2.32E-01	6.87E+01	3.38E-03
White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW									

South Pit Soils - Conservative Analysis

Brine Service Company Superfund Site

**South Pit
Soil (Conservative HQs)
Eastern Cottontail**

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	1.6E-01	1.8E+02	1.8E+01	5.2E+01	3.5E-01
Cadmium	8.0E-04	7.0E+00	5.9E-01	4.1E+00	3.1E-01	7.7E-01	4.0E-01
Chromium	6.4E-04	1.8E+02	4.1E-02	7.3E+00	1.4E+00	2.4E+00	5.8E-01
Copper	3.4E-03	1.1E+02	1.2E-01	1.3E+01	1.4E+00	5.6E+00	2.5E-01
Lead	2.4E-03	2.8E+02	2.7E-01	7.4E+01	6.3E+00	4.7E+00	1.3E+00
Manganese	2.7E+00	4.9E+02	7.9E-02	3.9E+01	5.4E+00	5.2E+01	1.0E-01
Nickel	1.2E-02	1.4E+01	1.8E-02	2.4E-01	8.7E-02	1.7E+00	5.1E-02
Selenium	4.8E-03	1.7E+00	6.7E-01	1.1E+00	8.5E-02	1.4E-01	6.0E-01
Silver	3.5E-03	6.1E-01	1.4E-02	8.6E-03	4.1E-03	6.0E+00	6.8E-04
Vanadium	7.4E-03	2.1E+01	4.9E-03	9.9E-02	1.1E-01	3.4E+00	3.3E-02
Zinc	5.4E-02	2.7E+03	3.7E-01	9.9E+02	8.0E+01	7.5E+01	1.1E+00
Mercury	7.4E-05	2.0E+00	6.5E-01	1.3E+00	9.6E-02	3.8E-01	2.5E-01
4,4'-DDD	5.6E-06	1.1E-01	1.8E-01	1.9E-02	1.9E-03	1.5E-01	1.3E-02
4,4'-DDE	1.0E-05	3.3E-02	6.2E-02	2.0E-03	3.1E-04	1.5E-01	2.1E-03
4,4'-DDT	4.8E+01	3.4E-02	6.2E-02	2.1E-03	5.8E+00	1.5E-01	3.9E+01
alpha-Chlordane	7.5E-06	1.4E-02	1.6E-01	2.2E-03	2.2E-04	2.0E+00	1.1E-04
beta-BHC	6.1E-05	2.3E-01	2.0E-03	4.5E-04	1.2E-03	4.0E+00	3.0E-04
Dieldrin	2.5E-05	5.7E-02	3.9E-01	2.2E-02	1.8E-03	1.5E-02	1.2E-01
Endrin	2.5E-05	2.2E-02	5.8E-03	1.3E-04	1.2E-04	6.5E-02	1.9E-03
Endrin aldehyde	1.4E-05	1.0E-01	6.8E-01	6.8E-02	5.0E-03	6.5E-02	7.8E-02
gamma-BHC (Lindane)	6.2E-06	1.3E-02	2.0E-03	2.5E-05	6.9E-05	5.0E+00	1.4E-05
gamma-chlordane	3.9E-06	2.1E-01	1.6E-01	3.4E-02	3.3E-03	2.4E+00	1.4E-03
Heptachlor	1.4E-05	Not detected in surface soil					
Heptachlor epoxide	1.6E-05	1.7E-02	2.4E+00	4.1E-02	2.8E-03	2.5E-01	1.1E-02
Total PCBs	2.0E-04	3.7E-01	1.7E-01	6.2E-02	6.0E-03	2.0E-01	3.0E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil					
Benzaldehyde	5.0E-05	7.6E-03	2.6E+00	2.0E-02	1.4E-03	5.0E+01	2.7E-05
Carbazole	5.0E-05	1.9E-02	1.2E+01	2.3E-01	1.6E-02	6.6E+01	2.4E-04
Dibenzofuran	5.0E-05	7.5E-02	1.3E+00	9.7E-02	6.8E-03	6.0E+00	1.1E-03
High Molecular Weight PAHs	5.0E-04	1.1E+00	3.4E-01	3.6E-01	2.9E-02	6.2E-01	4.8E-02
Cyanide	4.0E-03	7.0E+00	1.3E-01	9.0E-01	9.6E-02	6.9E+01	1.4E-03

Eastern Cottontail consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Conservative HQs)

Coyote

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	5.7E-02	6.7E+01	4.3E+00	5.2E+01	8.3E-02
Cadmium	8.0E-04	7.0E+00	5.2E-01	3.6E+00	1.6E-01	7.7E-01	2.1E-01
Chromium	6.4E-04	1.8E+02	8.5E-02	1.5E+01	8.6E-01	2.4E+00	3.6E-01
Copper	3.4E-03	1.1E+02	2.4E-01	2.5E+01	1.2E+00	5.6E+00	2.2E-01
Lead	2.4E-03	2.8E+02	7.4E-02	2.0E+01	1.2E+00	4.7E+00	2.6E-01
Manganese	2.7E+00	4.9E+02	2.1E-02	1.0E+01	1.2E+00	5.2E+01	2.4E-02
Nickel	1.2E-02	1.4E+01	1.1E-01	1.5E+00	8.4E-02	1.7E+00	4.9E-02
Selenium	4.8E-03	1.7E+00	5.2E-01	8.9E-01	4.0E-02	1.4E-01	2.8E-01
Silver	3.5E-03	6.1E-01	4.0E-03	2.4E-03	1.1E-03	6.0E+00	1.8E-04
Vanadium	7.4E-03	2.1E+01	1.2E-02	2.5E-01	3.6E-02	3.4E+00	1.0E-02
Zinc	5.4E-02	2.7E+03	5.7E-01	1.5E+03	6.9E+01	7.5E+01	9.2E-01
Mercury	7.4E-05	2.0E+00	5.4E-02	1.1E-01	7.0E-03	3.8E-01	1.8E-02
4,4'-DDD	5.6E-06	1.1E-01	1.8E+00	2.0E-01	8.6E-03	1.5E-01	5.9E-02
4,4'-DDE	1.0E-05	3.3E-02	2.0E+00	6.7E-02	2.9E-03	1.5E-01	2.0E-02
4,4'-DDT	4.8E+01	3.4E-02	2.0E+00	6.9E-02	3.6E+00	1.5E-01	2.5E+01
alpha-Chlordane	7.5E-06	1.4E-02	1.5E+00	2.0E-02	8.9E-04	2.0E+00	4.5E-04
beta-BHC	6.1E-05	2.3E-01	1.5E+00	3.4E-01	1.5E-02	4.0E+00	3.7E-03
Dieldrin	2.5E-05	5.7E-02	4.4E+00	2.5E-01	1.1E-02	1.5E-02	7.2E-01
Endrin	2.5E-05	2.2E-02	4.9E+00	1.1E-01	4.7E-03	6.5E-02	7.2E-02
Endrin aldehyde	1.4E-05	1.0E-01	1.5E+00	1.5E-01	6.4E-03	6.5E-02	9.8E-02
gamma-BHC (Lindane)	6.2E-06	1.3E-02	1.5E+00	1.9E-02	8.3E-04	5.0E+00	1.7E-04
gamma-chlordane	3.9E-06	2.1E-01	1.5E+00	3.1E-01	1.3E-02	2.4E+00	5.6E-03
Heptachlor	1.4E-05	Not detected in surface soil					
Heptachlor epoxide	1.6E-05	1.7E-02	1.5E+00	2.5E-02	1.1E-03	2.5E-01	4.3E-03
Total PCBs	2.0E-04	3.7E-01	1.9E-01	7.0E-02	3.5E-03	2.0E-01	1.7E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil					
Benzaldehyde	5.0E-05	7.6E-03	1.0E+00	7.6E-03	3.4E-04	5.0E+01	6.8E-06
Carbazole	5.0E-05	1.9E-02	1.0E-06	1.9E-08	2.7E-05	6.6E+01	4.1E-07
Dibenzofuran	5.0E-05	7.5E-02	1.5E+00	1.1E-01	4.8E-03	6.0E+00	8.0E-04
High Molecular Weight PAHs	5.0E-04	1.1E+00	1.0E-05	1.1E-05	1.3E-03	6.2E-01	2.1E-03
Cyanide	4.0E-03	7.0E+00	4.1E-02	2.8E-01	2.1E-02	6.9E+01	3.0E-04
Coyote consumes 100% terrestrial mammals. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW							

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Conservative HQs) Least Shrew							
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	9.1E-02	1.1E+02	2.7E+01	5.2E+01	5.2E-01
Cadmium	8.0E-04	7.0E+00	7.7E+00	5.4E+01	7.7E+00	7.7E-01	1.0E+01
Chromium	6.4E-04	1.8E+02	3.1E-01	5.4E+01	9.5E+00	2.4E+00	3.9E+00
Copper	3.4E-03	1.1E+02	5.2E-01	5.4E+01	8.7E+00	5.6E+00	1.5E+00
Lead	2.4E-03	2.8E+02	3.9E-02	1.1E+01	4.3E+00	4.7E+00	9.1E-01
Manganese	2.7E+00	4.9E+02	5.4E-02	2.6E+01	9.0E+00	5.2E+01	1.7E-01
Nickel	1.2E-02	1.4E+01	1.1E+00	1.4E+01	2.2E+00	1.7E+00	1.3E+00
Selenium	4.8E-03	1.7E+00	9.9E-01	1.7E+00	2.5E-01	1.4E-01	1.8E+00
Silver	3.5E-03	6.1E-01	2.0E+00	1.2E+00	1.8E-01	6.0E+00	3.0E-02
Vanadium	7.4E-03	2.1E+01	4.2E-02	8.6E-01	3.3E-01	3.4E+00	9.5E-02
Zinc	5.4E-02	2.7E+03	3.2E+00	8.6E+03	1.2E+03	7.5E+01	1.7E+01
Mercury	7.4E-05	2.0E+00	1.7E+00	3.4E+00	4.9E-01	3.8E-01	1.3E+00
4,4'-DDD	5.6E-06	1.1E-01	3.2E+00	3.6E-01	5.1E-02	1.5E-01	3.5E-01
4,4'-DDE	1.0E-05	3.3E-02	1.0E+01	3.3E-01	4.7E-02	1.5E-01	3.2E-01
4,4'-DDT	4.8E+01	3.4E-02	1.0E+01	3.4E-01	7.1E+00	1.5E-01	4.9E+01
alpha-Chlordane	7.5E-06	1.4E-02	2.9E+01	4.0E-01	5.7E-02	2.0E+00	2.8E-02
beta-BHC	6.1E-05	2.3E-01	3.0E-01	6.9E-02	1.2E-02	4.0E+00	3.0E-03
Dieldrin	2.5E-05	5.7E-02	1.7E+01	9.5E-01	1.3E-01	1.5E-02	9.0E+00
Endrin	2.5E-05	2.2E-02	3.7E+01	8.1E-01	1.1E-01	6.5E-02	1.8E+00
Endrin aldehyde	1.4E-05	1.0E-01	4.7E+00	4.7E-01	6.7E-02	6.5E-02	1.0E+00
gamma-BHC (Lindane)	6.2E-06	1.3E-02	2.9E+00	3.8E-02	5.5E-03	5.0E+00	1.1E-03
gamma-chlordane	3.9E-06	2.1E-01	2.9E+01	6.0E+00	8.5E-01	2.4E+00	3.6E-01
Heptachlor	1.4E-05	Not detected in surface soil					
Heptachlor epoxide	1.6E-05	1.7E-02	1.1E+01	1.8E-01	2.5E-02	2.5E-01	1.0E-01
Total PCBs	2.0E-04	3.7E-01	2.8E-01	1.0E-01	1.8E-02	2.0E-01	9.1E-02
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil					
Benzaldehyde	5.0E-05	7.6E-03	1.0E+00	7.6E-03	1.2E-03	5.0E+01	2.3E-05
Carbazole	5.0E-05	1.9E-02	2.3E+00	4.4E-02	6.4E-03	6.6E+01	9.7E-05
Dibenzofuran	5.0E-05	7.5E-02	5.7E+00	4.3E-01	6.1E-02	6.0E+00	1.0E-02
High Molecular Weight PAHs	5.0E-04	1.1E+00	1.8E+00	1.9E+00	2.7E-01	6.2E-01	4.4E-01
Cyanide	4.0E-03	7.0E+00	3.0E-01	2.1E+00	3.6E-01	6.9E+01	5.3E-03
Least Shrew consumes 100% terrestrial plants Dose = (WI x Water Conc) + (FI x Soil Conc. X UFinvertebrates x 1) + (SI x Soil Conc.)/BW							

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Conservative HQs) Texas Pocket Gopher							
COC	Maximum Surface Water Conc (mg/L)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	2.2E+03	1.6E-01	3.5E+02	4.1E+01	5.2E+01	8.0E-01
Cadmium	8.0E-04	2.0E+01	5.9E-01	1.1E+01	1.0E+00	7.7E-01	1.4E+00
Chromium	6.4E-04	2.3E+02	4.1E-02	9.6E+00	2.2E+00	2.4E+00	9.2E-01
Copper	3.4E-03	2.3E+02	1.2E-01	2.9E+01	3.8E+00	5.6E+00	6.7E-01
Lead	2.4E-03	3.6E+02	2.7E-01	9.5E+01	9.9E+00	4.7E+00	2.1E+00
Manganese	2.7E+00	4.8E+02	7.9E-02	3.8E+01	6.3E+00	5.2E+01	1.2E-01
Nickel	1.2E-02	6.0E+01	1.8E-02	1.1E+00	4.6E-01	1.7E+00	2.7E-01
Selenium	4.8E-03	3.8E+00	6.7E-01	2.5E+00	2.3E-01	1.4E-01	1.6E+00
Silver	3.5E-03	1.6E+00	1.4E-02	2.2E-02	1.2E-02	6.0E+00	2.0E-03
Vanadium	7.4E-03	2.8E+01	4.9E-03	1.3E-01	1.8E-01	3.4E+00	5.3E-02
Zinc	5.4E-02	2.1E+03	3.7E-01	7.8E+02	7.5E+01	7.5E+01	1.0E+00
Mercury	7.4E-05	2.3E+01	6.5E-01	1.5E+01	1.3E+00	3.8E-01	3.5E+00
4,4'-DDD	5.6E-06	8.6E-02	1.8E-01	1.5E-02	1.7E-03	1.5E-01	1.2E-02
4,4'-DDE	1.0E-05	Not detected in the 1-2 foot depth					
4,4'-DDT	4.8E+01	8.8E-02	6.2E-02	5.5E-03	5.2E+00	1.5E-01	3.5E+01
alpha-Chlordane	7.5E-06	2.5E-01	1.6E-01	4.0E-02	4.7E-03	2.0E+00	2.4E-03
beta-BHC	6.1E-05	6.3E-02	2.0E-03	1.2E-04	4.0E-04	4.0E+00	1.0E-04
Dieldrin	2.5E-05	2.5E-02	3.9E-01	9.6E-03	9.3E-04	1.5E-02	6.2E-02
Endrin	2.5E-05	3.8E-02	5.8E-03	2.2E-04	2.5E-04	6.5E-02	3.9E-03
Endrin aldehyde	1.4E-05	2.8E-02	6.8E-01	1.9E-02	1.7E-03	6.5E-02	2.6E-02
gamma-BHC (Lindane)	6.2E-06	Not detected in the 1-2 foot depth					
gamma-chlordane	3.9E-06	3.1E-01	1.6E-01	5.0E-02	5.9E-03	2.4E+00	2.4E-03
Heptachlor	1.4E-05	6.9E-02	2.4E+00	1.7E-01	1.4E-02	1.0E-01	1.4E-01
Heptachlor epoxide	1.6E-05	3.3E-01	2.4E+00	8.1E-01	6.6E-02	2.5E-01	2.7E-01
Total PCBs	2.0E-04	7.8E-01	1.7E-01	1.3E-01	1.5E-02	2.0E-01	7.6E-02
2,4-Dimethylphenol	8.0E-05	1.9E-01	1.7E+00	3.2E-01	2.7E-02	1.0E+02	2.6E-04
Benzaldehyde	5.0E-05	1.3E+00	2.6E+00	3.4E+00	2.8E-01	5.0E+01	5.5E-03
Carbazole	5.0E-05	4.5E-01	1.2E+01	5.5E+00	4.4E-01	6.6E+01	6.7E-03
Dibenzofuran	5.0E-05	1.9E-01	1.3E+00	2.5E-01	2.1E-02	6.0E+00	3.5E-03
High Molecular Weight PAHs	5.0E-04	3.0E+01	3.4E-01	1.0E+01	9.9E-01	6.2E-01	1.6E+00
Cyanide	4.0E-03	2.3E+00	1.3E-01	3.0E-01	3.9E-02	6.9E+01	5.7E-04
Texas pocket gopher consumes 100% terrestrial plants. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW Texas pocket gopher is exposed to the 1-2 foot soil zone only.							

South Pit Soil - Conservative Analysis
Brine Service Company Superfund Site

South Pit Soil (Conservative HQs) Nine-banded Armadillo										
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	2.2E+03	9.10E-02	1.07E+02	1.6E-01	1.8E+02	2.6E+01	5.20E+01	4.98E-01
Cadmium	8.0E-04	7.0E+00	2.0E+01	7.71E+00	5.39E+01	5.9E-01	4.1E+00	2.7E+00	7.70E-01	3.56E+00
Chromium	6.4E-04	1.8E+02	2.3E+02	3.06E-01	5.45E+01	4.1E-02	7.3E+00	4.7E+00	2.40E+00	1.96E+00
Copper	3.4E-03	1.1E+02	2.3E+02	5.15E-01	5.41E+01	1.2E-01	1.3E+01	4.7E+00	5.60E+00	8.41E-01
Lead	2.4E-03	2.8E+02	3.6E+02	3.89E-02	1.08E+01	2.7E-01	7.4E+01	4.1E+00	4.70E+00	8.72E-01
Manganese	2.7E+00	4.9E+02	4.9E+02	5.40E-02	2.65E+01	7.9E-02	3.9E+01	6.1E+00	5.15E+01	1.18E-01
Nickel	1.2E-02	1.4E+01	6.0E+01	1.06E+00	1.44E+01	1.8E-02	2.4E-01	1.2E+00	1.70E+00	7.17E-01
Selenium	4.8E-03	1.7E+00	3.8E+00	9.85E-01	1.67E+00	6.7E-01	1.1E+00	1.2E-01	1.43E-01	8.33E-01
Silver	3.5E-03	6.1E-01	1.6E+00	2.05E+00	1.25E+00	1.4E-02	8.6E-03	7.4E-02	6.02E+00	1.22E-02
Vanadium	7.4E-03	2.1E+01	2.8E+01	4.20E-02	8.61E-01	4.9E-03	9.9E-02	2.9E-01	3.43E+00	8.43E-02
Zinc	5.4E-02	2.7E+03	2.7E+03	3.20E+00	8.64E+03	3.7E-01	9.9E+02	4.4E+02	7.54E+01	5.80E+00
Mercury	7.4E-05	2.0E+00	2.3E+01	1.69E+00	3.35E+00	6.5E-01	1.3E+00	3.7E-01	3.80E-01	9.75E-01
4,4'-DDD	5.6E-06	1.1E-01	1.1E-01	3.24E+00	3.56E-01	1.8E-01	1.9E-02	1.8E-02	1.47E-01	1.22E-01
4,4'-DDE	1.0E-05	3.3E-02	3.3E-02	9.95E+00	3.28E-01	6.2E-02	2.0E-03	1.6E-02	1.47E-01	1.08E-01
4,4'-DDT	4.8E+01	3.4E-02	8.8E-02	9.95E+00	3.38E-01	6.2E-02	2.1E-03	4.1E+00	1.47E-01	2.79E+01
alpha-Chlordane	7.5E-06	1.4E-02	2.5E-01	2.87E+01	4.02E-01	1.6E-01	2.2E-03	2.1E-02	2.00E+00	1.06E-02
beta-BHC	6.1E-05	2.3E-01	2.3E-01	3.00E-01	6.90E-02	2.0E-03	4.5E-04	5.3E-03	4.00E+00	1.33E-03
Dieldrin	2.5E-05	5.7E-02	5.7E-02	1.67E+01	9.52E-01	3.9E-01	2.2E-02	4.6E-02	1.50E-02	3.04E+00
Endrin	2.5E-05	2.2E-02	3.8E-02	3.69E+01	8.12E-01	5.8E-03	1.3E-04	3.9E-02	6.50E-02	5.95E-01
Endrin aldehyde	1.4E-05	1.0E-01	1.0E-01	4.70E+00	4.70E-01	6.8E-01	6.8E-02	2.3E-02	6.50E-02	3.61E-01
gamma-BHC (Lindane)	6.2E-06	1.3E-02	1.3E-02	2.92E+00	3.80E-02	2.0E-03	2.5E-05	1.9E-03	5.00E+00	3.82E-04
gamma-chlordane	3.9E-06	2.1E-01	3.1E-01	2.87E+01	6.03E+00	1.6E-01	3.4E-02	2.9E-01	2.40E+00	1.20E-01
Heptachlor	1.4E-05	ND	6.9E-02	1.05E+01	7.25E-01	2.4E+00	1.7E-01	3.6E-02	1.00E-01	3.57E-01
Heptachlor epoxide	1.6E-05	1.7E-02	3.3E-01	1.05E+01	1.79E-01	2.4E+00	4.1E-02	1.2E-02	2.50E-01	4.64E-02
Total PCBs	2.0E-04	3.7E-01	7.8E-01	2.80E-01	1.03E-01	1.7E-01	6.2E-02	1.2E-02	2.00E-01	6.08E-02
2,4-Dimethylphenol	8.0E-05	ND	1.9E-01	1.88E+00	3.57E-01	1.7E+00	3.2E-01	2.0E-02	1.01E+02	2.01E-04
Benzaldehyde	5.0E-05	7.6E-03	1.3E+00	1.00E+00	7.60E-03	2.6E+00	2.0E-02	1.2E-02	5.00E+01	2.41E-04
Carbazole	5.0E-05	1.9E-02	4.5E-01	2.31E+00	4.39E-02	1.2E+01	2.3E-01	7.3E-03	6.56E+01	1.11E-04
Dibenzofuran	5.0E-05	7.5E-02	1.9E-01	5.72E+00	4.29E-01	1.3E+00	9.7E-02	2.2E-02	6.00E+00	3.75E-03
High Molecular Weight PAHs	5.0E-04	1.1E+00	3.0E+01	1.77E+00	1.86E+00	3.4E-01	3.6E-01	3.5E-01	6.15E-01	5.74E-01
Cyanide	4.0E-03	7.0E+00	7.0E+00	3.01E-01	2.09E+00	1.3E-01	9.0E-01	1.7E-01	6.87E+01	2.42E-03

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Since heptachlor and 2,4-dimethylphenol were not detected in surface soil the 0-2 foot concentration was used to estimate food concentrations.

South Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

**South Pit
Soil (Conservative HQs)
Texas Indigo Snake**

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	5.7E-02	6.7E+01	1.4E+01	2.1E+00	6.7E+00
Cadmium	8.0E-04	7.0E+00	5.2E-01	3.6E+00	5.4E-01	1.5E-01	3.7E+00
Chromium	6.4E-04	1.8E+02	8.5E-02	1.5E+01	2.8E+00	2.7E-01	1.1E+01
Copper	3.4E-03	1.1E+02	2.4E-01	2.5E+01	4.0E+00	4.1E-01	9.8E+00
Lead	2.4E-03	2.8E+02	7.4E-02	2.0E+01	3.9E+00	1.6E-01	2.4E+01
Manganese	2.7E+00	4.9E+02	2.1E-02	1.0E+01	3.3E+00	1.8E+01	1.9E-01
Nickel	1.2E-02	1.4E+01	1.1E-01	1.5E+00	2.7E-01	6.7E-01	4.0E-01
Selenium	4.8E-03	1.7E+00	5.2E-01	8.9E-01	1.3E-01	2.9E-02	4.5E+00
Silver	3.5E-03	6.1E-01	4.0E-03	2.4E-03	2.7E-03	2.0E-01	1.4E-02
Vanadium	7.4E-03	2.1E+01	1.2E-02	2.5E-01	1.2E-01	9.9E-02	1.2E+00
Zinc	5.4E-02	2.7E+03	5.7E-01	1.5E+03	2.3E+02	6.6E+00	3.4E+01
Mercury	7.4E-05	2.0E+00	5.4E-02	1.1E-01	2.3E-02	4.5E-02	5.1E-01
4,4'-DDD	5.6E-06	1.1E-01	1.8E+00	2.0E-01	2.8E-02	2.3E-02	1.2E+00
4,4'-DDE	1.0E-05	3.3E-02	2.0E+00	6.7E-02	9.6E-03	2.3E-02	4.2E-01
4,4'-DDT	4.8E+01	3.4E-02	2.0E+00	6.9E-02	9.8E-03	2.3E-02	4.3E-01
alpha-Chlordane	7.5E-06	1.4E-02	1.5E+00	2.0E-02	2.9E-03	2.1E-01	1.4E-02
beta-BHC	6.1E-05	2.3E-01	1.5E+00	3.4E-01	4.8E-02	4.0E-01	1.2E-01
Dieldrin	2.5E-05	5.7E-02	4.4E+00	2.5E-01	3.5E-02	7.1E-03	5.0E+00
Endrin	2.5E-05	2.2E-02	4.9E+00	1.1E-01	1.5E-02	1.0E-02	1.5E+00
Endrin aldehyde	1.4E-05	1.0E-01	1.5E+00	1.5E-01	2.1E-02	1.0E-02	2.0E+00
gamma-BHC (Lindane)	6.2E-06	1.3E-02	1.5E+00	1.9E-02	2.7E-03	4.0E-01	6.8E-03
gamma-chlordane	3.9E-06	2.1E-01	1.5E+00	3.1E-01	4.4E-02	2.1E-01	2.0E-01
Heptachlor	1.4E-05	Not detected in surface soil					
Heptachlor epoxide	1.6E-05	1.7E-02	1.5E+00	2.5E-02	3.5E-03	1.7E-01	2.1E-02
Total PCBs	2.0E-04	3.7E-01	1.9E-01	7.0E-02	1.1E-02	4.0E-02	2.8E-01
2,4-Dimethylphenol	8.0E-05	Not detected in surface soil					
Benzaldehyde	5.0E-05	7.6E-03	1.0E+00	7.6E-03	1.1E-03	No TRV	No TRV
Carbazole	5.0E-05	1.9E-02	1.0E-06	1.9E-08	7.4E-05	1.7E+02	4.5E-07
Dibenzofuran	5.0E-05	7.5E-02	1.5E+00	1.1E-01	1.6E-02	1.0E-01	1.5E-01
High Molecular Weight PAHs	5.0E-04	1.1E+00	1.0E-05	1.1E-05	4.1E-03	2.0E-01	2.1E-02
Cyanide	4.0E-03	7.0E+00	4.1E-02	2.8E-01	6.7E-02	6.5E-02	1.0E+00

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

SLERA NOAEL HQ Summary for Terrestrial Species at South Area Soils - Conservative Analysis

Terrestrial										
COC	Red-Tailed Hawk	American Robin	Mourning Dove	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake
	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ
Barium	2.8E-01	1.4E+00	1.7E+00	4.6E-01	3.5E-01	8.3E-02	5.2E-01	8.0E-01	5.0E-01	6.7E+00
Cadmium	1.5E-01	2.8E+00	3.9E-01	5.4E+00	4.0E-01	2.1E-01	1.0E+01	1.4E+00	3.6E+00	3.7E+00
Chromium	4.4E-01	2.1E+00	1.1E+00	2.0E+00	5.8E-01	3.6E-01	3.9E+00	9.2E-01	2.0E+00	1.1E+01
Copper	4.0E-01	1.4E+00	6.8E-01	9.0E-01	2.5E-01	2.2E-01	1.5E+00	6.7E-01	8.4E-01	9.8E+00
Lead	1.0E+00	4.9E+00	7.4E+00	1.4E+00	1.3E+00	2.6E-01	9.1E-01	2.1E+00	8.7E-01	2.4E+01
Manganese	8.6E-03	4.8E-02	5.9E-02	1.2E-01	1.0E-01	2.4E-02	1.7E-01	1.2E-01	1.2E-01	1.9E-01
Nickel	1.7E-02	1.7E-01	2.8E-02	6.4E-01	5.1E-02	4.9E-02	1.3E+00	2.7E-01	7.2E-01	4.0E-01
Selenium	1.9E-01	7.4E-01	5.5E-01	1.4E+00	6.0E-01	2.8E-01	1.8E+00	1.6E+00	8.3E-01	4.5E+00
Silver	6.7E-04	4.7E-02	4.2E-03	1.5E-02	6.8E-04	1.8E-04	3.0E-02	2.0E-03	1.2E-02	1.4E-02
Vanadium	4.9E-02	2.2E-01	2.5E-01	3.7E-02	3.3E-02	1.0E-02	9.5E-02	5.3E-02	8.4E-02	1.2E+00
Zinc	1.4E+00	1.1E+01	2.3E+00	9.2E+00	1.1E+00	9.2E-01	1.7E+01	1.0E+00	5.8E+00	3.4E+01
Mercury	2.1E-02	7.7E-01	4.0E-01	8.8E-01	2.5E-01	1.8E-02	1.3E+00	3.5E+00	9.7E-01	5.1E-01
4,4'-DDD	5.1E-02	1.2E-01	1.6E-02	1.8E-01	1.3E-02	5.9E-02	3.5E-01	1.2E-02	1.2E-01	1.2E+00
4,4'-DDE	1.7E-02	1.0E-01	2.8E-03	1.6E-01	2.1E-03	2.0E-02	3.2E-01	ND	1.1E-01	4.2E-01
4,4'-DDT	1.3E+01	3.0E+01	2.6E+01	4.9E+01	3.9E+01	2.5E+01	4.9E+01	3.5E+01	2.8E+01	4.3E-01
Hazard Index: DDT, DDE and DDD	1.3E+01	3.0E+01	2.6E+01	4.9E+01	3.9E+01	2.5E+01	4.9E+01	3.5E+01	2.8E+01	2.1E+00
alpha-Chlordane	5.6E-04	1.3E-02	2.0E-04	1.4E-02	1.1E-04	4.5E-04	2.8E-02	2.4E-03	1.1E-02	1.4E-02
beta-BHC	4.9E-03	1.7E-03	6.7E-04	1.4E-03	3.0E-04	3.7E-03	3.0E-03	1.0E-04	1.3E-03	1.2E-01
Dieldrin	2.0E-01	9.8E-01	4.7E-02	4.6E+00	1.2E-01	7.2E-01	9.0E+00	6.2E-02	3.0E+00	5.0E+00
Endrin	6.0E-02	5.6E-01	2.6E-03	8.9E-01	1.9E-03	7.2E-02	1.8E+00	3.9E-03	6.0E-01	1.5E+00
Endrin aldehyde	8.3E-02	3.8E-01	9.1E-02	5.9E-01	7.8E-02	9.8E-02	1.0E+00	2.6E-02	3.6E-01	2.0E+00
gamma-BHC (Lindane)	2.8E-04	7.0E-04	3.8E-05	5.5E-04	1.4E-05	1.7E-04	1.1E-03	ND	3.8E-04	6.8E-03
gamma-chlordane	8.4E-03	2.0E-01	3.0E-03	1.8E-01	1.4E-03	5.6E-03	3.6E-01	2.4E-03	1.2E-01	2.0E-01
Heptachlor	ND	ND	ND	ND	ND	ND	ND	1.4E-01	3.6E-01	ND
Heptachlor epoxide	8.6E-04	9.3E-03	3.1E-03	6.3E-02	1.1E-02	4.3E-03	1.0E-01	2.7E-01	4.6E-02	2.1E-02
Total PCBs	1.2E-02	3.6E-02	2.9E-02	6.4E-02	3.0E-02	1.7E-02	9.1E-02	7.6E-02	6.1E-02	2.8E-01
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	2.6E-04	2.0E-04	No TRV
Benzaldehyde	No TRV	No TRV	No TRV	3.9E-05	2.7E-05	6.8E-06	2.3E-05	5.5E-03	2.4E-04	No TRV
Carbazole	2.1E-08	1.2E-05	1.7E-05	3.0E-04	2.4E-04	4.1E-07	9.7E-05	6.7E-03	1.1E-04	4.5E-07
Dibenzofuran	6.3E-03	3.7E-02	1.2E-02	6.3E-03	1.1E-03	8.0E-04	1.0E-02	3.5E-03	3.7E-03	1.5E-01
High Molecular Weight PAHs	8.8E-04	8.3E-02	2.8E-02	2.6E-01	4.8E-02	2.1E-03	4.4E-01	1.6E+00	5.7E-01	2.1E-02
Cyanide	4.3E-02	4.1E-01	2.9E-01	3.4E-03	1.4E-03	3.0E-04	5.3E-03	5.7E-04	2.4E-03	1.0E+00

North Pit Soils
SLERA HQ Calculations
Conservative Analysis
EPC = maximum detected concentration
AUF = 1
NOAEL-based HQs

North Pit Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus Linneaus</i>	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	1.50E-02	i	NA	2.8	d	4.20E-04	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Based on Nagy, 2001 for carnivorous reptiles										

North Pit Soil
Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	Terrestrial			
Document Type:	SLERA			
Location:	North Pit (Conservative Analysis)			
Risk from which Medium:	Soil			
Surface Water Data:	Surface Water data from North Portion of East Ditch			
COCs	Maximum Surface Water Conc. (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)
Arsenic	1.56E-02	8.70E+00	3.23E+01	3.23E+01
Barium	6.39E-01	1.18E+04	2.92E+03	1.18E+04
Cadmium	8.00E-04	1.56E+01	6.72E+01	6.72E+01
Chromium	6.41E-04	6.18E+01	1.45E+01	6.18E+01
Copper	3.44E-03	3.45E+01	4.75E+02	4.75E+02
Lead	2.38E-03	1.80E+03	8.58E+02	1.80E+03
Manganese	2.70E+00	3.79E+02	5.84E+02	5.84E+02
Nickel	1.22E-02	1.54E+01	1.06E+01	1.54E+01
Selenium	4.76E-03	1.20E+01	1.28E+01	1.28E+01
Silver	7.00E-04	6.41E-01	1.02E+01	1.02E+01
Vanadium	9.02E-03	2.54E+01	2.54E+01	2.54E+01
Zinc	5.42E-02	2.43E+03	1.37E+04	1.37E+04
Mercury	7.40E-05	8.97E+00	5.81E+01	5.81E+01
4,4'-DDD	5.60E-06	4.50E-02	ND	4.50E-02
4,4'-DDT	4.80E-05	1.00E-02	3.00E-03	1.00E-02
Aldrin	2.90E-05	2.40E-02	ND	2.40E-02
beta-BHC	6.10E-05	2.40E-03	1.20E-02	1.20E-02
Endrin	2.50E-05	6.10E-02	ND	6.10E-02
Endrin aldehyde	1.40E-05	2.00E-02	ND	2.00E-02
Total PCBs	2.00E-04	3.25E-02	3.64E-02	3.64E-02
High Molecular Weight PAHs	4.97E-04	2.58E+00	2.95E+00	2.95E+00
Pentachlorophenol	5.00E-05	ND	1.20E-02	1.20E-02
Bis(2-ethylhexyl)phthalate	1.10E-03	8.40E+01	5.30E-02	8.40E+01
Cyanide	4.00E-03	3.43E+01	2.30E+00	3.43E+01
Minimum detection limit in surface water used as surface water concentration if COPC not detected.				

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

Red-tailed Hawk

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.5E-03	2.2E-02	1.7E-02	2.2E+00	7.4E-03
Barium	6.4E-01	1.2E+04	5.7E-02	6.7E+02	5.8E+01	2.1E+01	2.8E+00
Cadmium	8.0E-04	1.6E+01	5.2E-01	8.1E+00	4.9E-01	1.5E+00	3.4E-01
Chromium	6.4E-04	6.2E+01	8.5E-02	5.2E+00	4.0E-01	2.7E+00	1.5E-01
Copper	3.4E-03	3.5E+01	2.4E-01	8.3E+00	5.3E-01	4.1E+00	1.3E-01
Lead	2.4E-03	1.8E+03	7.4E-02	1.3E+02	1.1E+01	1.6E+00	6.5E+00
Manganese	2.7E+00	3.8E+02	2.1E-02	7.8E+00	1.2E+00	1.8E+02	6.9E-03
Nickel	1.2E-02	1.5E+01	1.1E-01	1.8E+00	1.3E-01	6.7E+00	1.9E-02
Selenium	4.8E-03	1.2E+01	5.2E-01	6.3E+00	3.8E-01	2.9E-01	1.3E+00
Silver	7.00E-04	6.4E-01	4.0E-03	2.6E-03	1.2E-03	2.0E+00	6.2E-04
Vanadium	9.02E-03	2.5E+01	1.2E-02	3.1E-01	6.0E-02	9.9E-01	6.1E-02
Zinc	5.42E-02	2.4E+03	5.7E-01	1.4E+03	8.4E+01	6.6E+01	1.3E+00
Mercury	7.40E-05	9.0E+00	5.4E-02	4.9E-01	4.3E-02	4.5E-01	9.5E-02
4,4'-DDD	5.60E-06	4.5E-02	1.8E+00	8.1E-02	4.7E-03	2.3E-01	2.1E-02
4,4'-DDT	4.80E-05	1.0E-02	2.0E+00	2.0E-02	1.2E-03	2.3E-01	5.2E-03
Aldrin	2.90E-05	2.4E-02	2.4E+01	5.7E-01	3.3E-02	7.1E-02	4.6E-01
beta-BHC	6.10E-05	2.4E-03	1.5E+00	3.5E-03	2.1E-04	4.0E+00	5.2E-05
Endrin	2.50E-05	6.1E-02	4.9E+00	3.0E-01	1.7E-02	1.0E-01	1.7E-01
Endrin aldehyde	1.40E-05	2.0E-02	1.5E+00	2.9E-02	1.7E-03	1.0E-01	1.7E-02
Total PCBs	2.00E-04	3.3E-02	1.9E-01	6.2E-03	4.2E-04	4.0E-01	1.1E-03
Bis(2-ethylhexyl)phthalate	1.10E-03	8.4E+01	1.0E-01	8.4E+00	6.2E-01	3.5E-01	1.8E+00
High Molecular Weight PAHs	4.97E-04	2.6E+00	1.0E-05	2.6E-05	4.3E-03	2.0E+00	2.1E-03
Pentachlorophenol	Not detected in surface soil						
Cyanide	4.00E-03	3.4E+01	4.1E-02	1.4E+00	1.4E-01	6.5E-01	2.1E-01
Hawk consumes 100% terrestrial mammals in model. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW							

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis) Soil American Robin									
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.24E-01	1.95E+00	3.8E-02	3.3E-01	2.3E-01	2.24E+00	1.02E-01
Barium	6.4E-01	1.2E+04	9.10E-02	1.07E+03	1.6E-01	1.8E+03	2.95E+02	2.08E+01	1.42E+01
Cadmium	8.0E-04	1.6E+01	7.71E+00	1.20E+02	5.9E-01	9.1E+00	9.32E+00	1.47E+00	6.34E+00
Chromium	6.4E-04	6.2E+01	3.06E-01	1.89E+01	4.1E-02	2.5E+00	1.98E+00	2.66E+00	7.46E-01
Copper	3.4E-03	3.5E+01	5.15E-01	1.78E+01	1.2E-01	4.3E+00	1.82E+00	4.05E+00	4.50E-01
Lead	2.4E-03	1.8E+03	3.89E-02	7.00E+01	2.7E-01	4.8E+02	5.24E+01	1.63E+00	3.21E+01
Manganese	2.7E+00	3.8E+02	5.40E-02	2.05E+01	7.9E-02	3.0E+01	6.78E+00	1.79E+02	3.79E-02
Nickel	1.2E-02	1.5E+01	1.06E+00	1.63E+01	1.8E-02	2.8E-01	1.30E+00	6.71E+00	1.93E-01
Selenium	4.8E-03	1.2E+01	9.85E-01	1.18E+01	6.7E-01	8.1E+00	1.50E+00	2.90E-01	5.19E+00
Silver	7.0E-04	6.4E-01	2.05E+00	1.31E+00	1.4E-02	9.0E-03	9.87E-02	2.02E+00	4.89E-02
Vanadium	9.0E-03	2.5E+01	4.20E-02	1.07E+00	4.9E-03	1.2E-01	2.74E-01	9.88E-01	2.77E-01
Zinc	5.4E-02	2.4E+03	3.20E+00	7.78E+03	3.7E-01	8.9E+02	6.35E+02	6.61E+01	9.60E+00
Mercury	7.4E-05	9.0E+00	1.69E+00	1.52E+01	6.5E-01	5.8E+00	1.56E+00	4.50E-01	3.47E+00
4,4'-DDD	5.6E-06	4.5E-02	3.24E+00	1.46E-01	1.8E-01	7.9E-03	1.13E-02	2.27E-01	4.97E-02
4,4'-DDT	4.8E-05	1.0E-02	9.95E+00	9.95E-02	6.2E-02	6.2E-04	7.20E-03	2.27E-01	3.17E-02
Aldrin	2.9E-05	2.4E-02	9.74E+01	2.34E+00	2.2E-01	5.3E-03	1.67E-01	7.10E-02	2.35E+00
beta-BHC	6.1E-05	2.4E-03	3.00E-01	7.20E-04	2.0E-03	4.7E-06	7.80E-05	4.00E+00	1.95E-05
Endrin	2.5E-05	6.1E-02	3.69E+01	2.25E+00	5.8E-03	3.5E-04	1.61E-01	1.04E-01	1.55E+00
Endrin aldehyde	1.4E-05	2.0E-02	4.70E+00	9.40E-02	6.8E-01	1.4E-02	7.81E-03	1.04E-01	7.54E-02
Total PCBs	2.0E-04	3.3E-02	2.80E-01	9.10E-03	1.7E-01	5.5E-03	1.30E-03	4.00E-01	3.26E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	6.70E-01	5.63E+01	7.0E-02	5.9E+00	5.04E+00	3.48E-01	1.45E+01
High Molecular Weight PAHs	5.0E-04	2.6E+00	1.77E+00	4.57E+00	3.4E-01	8.8E-01	4.07E-01	2.00E+00	2.04E-01
Pentachlorophenol	Not detected in surface soil								
Cyanide	4.0E-03	3.4E+01	3.01E-01	1.03E+01	1.3E-01	4.4E+00	1.30E+00	6.53E-01	2.00E+00
Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW									

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis) Soil Mourning Dove							
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	3.8E-02	3.3E-01	1.4E-01	2.2E+00	6.3E-02
Barium	6.4E-01	1.2E+04	1.6E-01	1.8E+03	3.6E+02	2.1E+01	1.7E+01
Cadmium	8.0E-04	1.6E+01	5.9E-01	9.1E+00	1.3E+00	1.5E+00	8.8E-01
Chromium	6.4E-04	6.2E+01	4.1E-02	2.5E+00	1.0E+00	2.7E+00	3.8E-01
Copper	3.4E-03	3.5E+01	1.2E-01	4.3E+00	9.1E-01	4.1E+00	2.3E-01
Lead	2.4E-03	1.8E+03	2.7E-01	4.8E+02	7.9E+01	1.6E+00	4.8E+01
Manganese	2.7E+00	3.8E+02	7.9E-02	3.0E+01	8.3E+00	1.8E+02	4.6E-02
Nickel	1.2E-02	1.5E+01	1.8E-02	2.8E-01	2.1E-01	6.7E+00	3.1E-02
Selenium	4.8E-03	1.2E+01	6.7E-01	8.1E+00	1.1E+00	2.9E-01	3.9E+00
Silver	7.0E-04	6.4E-01	1.4E-02	9.0E-03	8.4E-03	2.0E+00	4.2E-03
Vanadium	9.0E-03	2.5E+01	4.9E-03	1.2E-01	3.0E-01	9.9E-01	3.1E-01
Zinc	5.4E-02	2.4E+03	3.7E-01	8.9E+02	1.4E+02	6.6E+01	2.1E+00
Mercury	7.4E-05	9.0E+00	6.5E-01	5.8E+00	8.1E-01	4.5E-01	1.8E+00
4,4'-DDD	5.6E-06	4.5E-02	1.8E-01	7.9E-03	1.5E-03	2.3E-01	6.5E-03
4,4'-DDT	4.8E-05	1.0E-02	6.2E-02	6.2E-04	1.9E-04	2.3E-01	8.6E-04
Aldrin	2.9E-05	2.4E-02	2.2E-01	5.3E-03	9.2E-04	7.1E-02	1.3E-02
beta-BHC	6.1E-05	2.4E-03	2.0E-03	4.7E-06	3.5E-05	4.0E+00	8.8E-06
Endrin	2.5E-05	6.1E-02	5.8E-03	3.5E-04	7.4E-04	1.0E-01	7.1E-03
Endrin aldehyde	1.4E-05	2.0E-02	6.8E-01	1.4E-02	1.9E-03	1.0E-01	1.8E-02
Total PCBs	2.0E-04	3.3E-02	1.7E-01	5.5E-03	1.1E-03	4.0E-01	2.6E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	7.0E-02	5.9E+00	1.7E+00	3.5E-01	4.8E+00
High Molecular Weight PAHs	5.0E-04	2.6E+00	3.4E-01	0.0E+00	2.9E-02	2.0E+00	1.5E-02
Pentachlorophenol	Not detected in surface soil				--		
Cyanide	4.0E-03	3.4E+01	1.3E-01	4.4E+00	9.3E-01	6.5E-01	1.4E+00

Mourning Dove consumes 100% terrestrial plants.
Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.24E-01	1.95E+00	3.8E-02	3.3E-01	1.9E-01	1.04E+00	1.81E-01
Barium	6.4E-01	1.2E+04	9.10E-02	1.07E+03	1.6E-01	1.8E+03	2.40E+02	5.20E+01	4.62E+00
Cadmium	8.0E-04	1.6E+01	7.71E+00	1.20E+02	5.9E-01	9.1E+00	9.22E+00	7.70E-01	1.20E+01
Chromium	6.4E-04	6.2E+01	3.06E-01	1.89E+01	4.1E-02	2.5E+00	1.70E+00	2.40E+00	7.07E-01
Copper	3.4E-03	3.5E+01	5.15E-01	1.78E+01	1.2E-01	4.3E+00	1.66E+00	5.60E+00	2.97E-01
Lead	2.4E-03	1.8E+03	3.89E-02	7.00E+01	2.7E-01	4.8E+02	4.40E+01	4.70E+00	9.37E+00
Manganese	2.7E+00	3.8E+02	5.40E-02	2.05E+01	7.9E-02	3.0E+01	5.06E+00	5.15E+01	9.82E-02
Nickel	1.2E-02	1.5E+01	1.06E+00	1.63E+01	1.8E-02	2.8E-01	1.22E+00	1.70E+00	7.19E-01
Selenium	4.8E-03	1.2E+01	9.85E-01	1.18E+01	6.7E-01	8.1E+00	1.45E+00	1.43E-01	1.01E+01
Silver	7.0E-04	6.4E-01	2.05E+00	1.31E+00	1.4E-02	9.0E-03	9.56E-02	6.02E+00	1.59E-02
Vanadium	9.0E-03	2.5E+01	4.20E-02	1.07E+00	4.9E-03	1.2E-01	1.58E-01	3.43E+00	4.60E-02
Zinc	5.4E-02	2.4E+03	3.20E+00	7.78E+03	3.7E-01	8.9E+02	6.22E+02	7.54E+01	8.25E+00
Mercury	7.4E-05	9.0E+00	1.69E+00	1.52E+01	6.5E-01	5.8E+00	1.52E+00	3.80E-01	3.99E+00
4,4'-DDD	5.6E-06	4.5E-02	3.24E+00	1.46E-01	1.8E-01	7.9E-03	1.10E-02	1.47E-01	7.51E-02
4,4'-DDT	4.8E-05	1.0E-02	9.95E+00	9.95E-02	6.2E-02	6.2E-04	7.14E-03	1.47E-01	4.86E-02
Aldrin	2.9E-05	2.4E-02	9.74E+01	2.34E+00	2.2E-01	5.3E-03	1.66E-01	1.50E-02	1.11E+01
beta-BHC	6.1E-05	2.4E-03	3.00E-01	7.20E-04	2.0E-03	4.7E-06	6.73E-05	4.00E+00	1.68E-05
Endrin	2.5E-05	6.1E-02	3.69E+01	2.25E+00	5.8E-03	3.5E-04	1.60E-01	6.50E-02	2.46E+00
Endrin aldehyde	1.4E-05	2.0E-02	4.70E+00	9.40E-02	6.8E-01	1.4E-02	7.70E-03	6.50E-02	1.18E-01
Total PCBs	2.0E-04	3.3E-02	2.80E-01	9.10E-03	1.7E-01	5.5E-03	1.15E-03	2.00E-01	5.77E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	6.70E-01	5.63E+01	7.0E-02	5.9E+00	4.65E+00	4.40E+01	1.06E-01
High Molecular Weight PAHs	5.0E-04	2.6E+00	1.77E+00	4.57E+00	3.4E-01	8.8E-01	3.94E-01	6.15E-01	6.41E-01
Pentachlorophenol	Not detected in surface soil								
Cyanide	4.0E-03	3.4E+01	3.01E-01	1.03E+01	1.3E-01	4.4E+00	1.14E+00	6.87E+01	1.67E-02

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW

North Pit Soils - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

Eastern Cottontail

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	3.8E-02	3.3E-01	6.8E-02	1.0E+00	6.5E-02
Barium	6.4E-01	1.2E+04	1.6E-01	1.8E+03	1.8E+02	5.2E+01	3.5E+00
Cadmium	8.0E-04	1.6E+01	5.9E-01	9.1E+00	6.9E-01	7.7E-01	8.9E-01
Chromium	6.4E-04	6.2E+01	4.1E-02	2.5E+00	4.8E-01	2.4E+00	2.0E-01
Copper	3.4E-03	3.5E+01	1.2E-01	4.3E+00	4.6E-01	5.6E+00	8.2E-02
Lead	2.4E-03	1.8E+03	2.7E-01	4.8E+02	4.1E+01	4.7E+00	8.7E+00
Manganese	2.7E+00	3.8E+02	7.9E-02	3.0E+01	4.3E+00	5.2E+01	8.3E-02
Nickel	1.2E-02	1.5E+01	1.8E-02	2.8E-01	9.8E-02	1.7E+00	5.8E-02
Selenium	4.8E-03	1.2E+01	6.7E-01	8.1E+00	6.0E-01	1.4E-01	4.2E+00
Silver	7.0E-04	6.4E-01	1.4E-02	9.0E-03	4.0E-03	6.0E+00	6.6E-04
Vanadium	9.0E-03	2.5E+01	4.9E-03	1.2E-01	1.4E-01	3.4E+00	4.0E-02
Zinc	5.4E-02	2.4E+03	3.7E-01	8.9E+02	7.2E+01	7.5E+01	9.5E-01
Mercury	7.4E-05	9.0E+00	6.5E-01	5.8E+00	4.3E-01	3.8E-01	1.1E+00
4,4'-DDD	5.6E-06	4.5E-02	1.8E-01	7.9E-03	7.6E-04	1.5E-01	5.2E-03
4,4'-DDT	4.8E-05	1.0E-02	6.2E-02	6.2E-04	9.8E-05	1.5E-01	6.7E-04
Aldrin	2.9E-05	2.4E-02	2.2E-01	5.3E-03	4.8E-04	1.5E-02	3.2E-02
beta-BHC	6.1E-05	2.4E-03	2.0E-03	4.7E-06	2.0E-05	4.0E+00	5.0E-06
Endrin	2.5E-05	6.1E-02	5.8E-03	3.5E-04	3.4E-04	6.5E-02	5.2E-03
Endrin aldehyde	1.4E-05	2.0E-02	6.8E-01	1.4E-02	1.0E-03	6.5E-02	1.6E-02
Total PCBs	2.0E-04	3.3E-02	1.7E-01	5.5E-03	5.5E-04	2.0E-01	2.8E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	7.0E-02	5.9E+00	8.2E-01	4.4E+01	1.9E-02
High Molecular Weight PAHs	5.0E-04	2.6E+00	3.4E-01	8.8E-01	7.2E-02	6.2E-01	1.2E-01
Pentachlorophenol	Not detected in surface soil						
Cyanide	4.0E-03	3.4E+01	1.3E-01	4.4E+00	4.7E-01	6.9E+01	6.8E-03

Eastern Cottontail consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil
Coyote

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.5E-03	2.2E-02	1.3E-02	1.0E+00	1.2E-02
Barium	6.4E-01	1.2E+04	5.7E-02	6.7E+02	4.3E+01	5.2E+01	8.2E-01
Cadmium	8.0E-04	1.6E+01	5.2E-01	8.1E+00	3.7E-01	7.7E-01	4.8E-01
Chromium	6.4E-04	6.2E+01	8.5E-02	5.2E+00	3.0E-01	2.4E+00	1.2E-01
Copper	3.4E-03	3.5E+01	2.4E-01	8.3E+00	4.0E-01	5.6E+00	7.1E-02
Lead	2.4E-03	1.8E+03	7.4E-02	1.3E+02	7.9E+00	4.7E+00	1.7E+00
Manganese	2.7E+00	3.8E+02	2.1E-02	7.8E+00	9.9E-01	5.2E+01	1.9E-02
Nickel	1.2E-02	1.5E+01	1.1E-01	1.8E+00	9.5E-02	1.7E+00	5.6E-02
Selenium	4.8E-03	1.2E+01	5.2E-01	6.3E+00	2.8E-01	1.4E-01	2.0E+00
Silver	7.0E-04	6.4E-01	4.0E-03	2.6E-03	9.3E-04	6.0E+00	1.5E-04
Vanadium	9.0E-03	2.5E+01	1.2E-02	3.1E-01	4.5E-02	3.4E+00	1.3E-02
Zinc	5.4E-02	2.4E+03	5.7E-01	1.4E+03	6.2E+01	7.5E+01	8.3E-01
Mercury	7.4E-05	9.0E+00	5.4E-02	4.9E-01	3.2E-02	3.8E-01	8.3E-02
4,4'-DDD	5.6E-06	4.5E-02	1.8E+00	8.1E-02	3.5E-03	1.5E-01	2.4E-02
4,4'-DDT	4.8E-05	1.0E-02	2.0E+00	2.0E-02	8.9E-04	1.5E-01	6.1E-03
Aldrin	2.9E-05	2.4E-02	2.4E+01	5.7E-01	2.4E-02	1.5E-02	1.6E+00
beta-BHC	6.1E-05	2.4E-03	1.5E+00	3.5E-03	1.6E-04	4.0E+00	3.9E-05
Endrin	2.5E-05	6.1E-02	4.9E+00	3.0E-01	1.3E-02	6.5E-02	2.0E-01
Endrin aldehyde	1.4E-05	2.0E-02	1.5E+00	2.9E-02	1.3E-03	6.5E-02	2.0E-02
Total PCBs	2.0E-04	3.3E-02	1.9E-01	6.2E-03	3.2E-04	2.0E-01	1.6E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	1.0E-01	8.4E+00	4.6E-01	4.4E+01	1.0E-02
High Molecular Weight PAHs	5.0E-04	2.6E+00	1.0E-05	2.6E-05	3.1E-03	6.2E-01	5.1E-03
Pentachlorophenol	Not detected in surface soil						
Cyanide	4.0E-03	3.4E+01	4.1E-02	1.4E+00	1.0E-01	6.9E+01	1.5E-03

Coyote consumes 100% terrestrial mammals.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

Least Shrew

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.2E-01	1.9E+00	3.6E-01	1.0E+00	3.5E-01
Barium	6.4E-01	1.2E+04	9.1E-02	1.1E+03	2.7E+02	5.2E+01	5.2E+00
Cadmium	8.0E-04	1.6E+01	7.7E+00	1.2E+02	1.7E+01	7.7E-01	2.2E+01
Chromium	6.4E-04	6.2E+01	3.1E-01	1.9E+01	3.3E+00	2.4E+00	1.4E+00
Copper	3.4E-03	3.5E+01	5.2E-01	1.8E+01	2.9E+00	5.6E+00	5.1E-01
Lead	2.4E-03	1.8E+03	3.9E-02	7.0E+01	2.8E+01	4.7E+00	5.9E+00
Manganese	2.7E+00	3.8E+02	5.4E-02	2.0E+01	7.0E+00	5.2E+01	1.4E-01
Nickel	1.2E-02	1.5E+01	1.1E+00	1.6E+01	2.5E+00	1.7E+00	1.4E+00
Selenium	4.8E-03	1.2E+01	9.9E-01	1.2E+01	1.8E+00	1.4E-01	1.3E+01
Silver	7.0E-04	6.4E-01	2.0E+00	1.3E+00	1.9E-01	6.0E+00	3.2E-02
Vanadium	9.0E-03	2.5E+01	4.2E-02	1.1E+00	4.0E-01	3.4E+00	1.2E-01
Zinc	5.4E-02	2.4E+03	3.2E+00	7.8E+03	1.1E+03	7.5E+01	1.5E+01
Mercury	7.4E-05	9.0E+00	1.7E+00	1.5E+01	2.2E+00	3.8E-01	5.9E+00
4,4'-DDD	5.6E-06	4.5E-02	3.2E+00	1.5E-01	2.1E-02	1.5E-01	1.4E-01
4,4'-DDT	4.8E-05	1.0E-02	1.0E+01	1.0E-01	1.4E-02	1.5E-01	9.6E-02
Aldrin	2.9E-05	2.4E-02	9.7E+01	2.3E+00	3.3E-01	1.5E-02	2.2E+01
beta-BHC	6.1E-05	2.4E-03	3.0E-01	7.2E-04	1.3E-04	4.0E+00	3.4E-05
Endrin	2.5E-05	6.1E-02	3.7E+01	2.3E+00	3.2E-01	6.5E-02	4.9E+00
Endrin aldehyde	1.4E-05	2.0E-02	4.7E+00	9.4E-02	1.3E-02	6.5E-02	2.1E-01
Total PCBs	2.00E-04	3.3E-02	2.8E-01	9.1E-03	1.6E-03	2.0E-01	8.2E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	6.7E-01	5.6E+01	8.8E+00	4.4E+01	2.0E-01
High Molecular Weight PAHs	5.0E-04	2.6E+00	1.8E+00	4.6E+00	6.7E-01	6.2E-01	1.1E+00
Pentachlorophenol	Not detected in surface soil				--		
Cyanide	4.0E-03	3.4E+01	3.0E-01	1.0E+01	1.8E+00	6.9E+01	2.6E-02

Least Shrew consumes 100% terrestrial plants

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFInvertebrates x 1) + (SI x Soil Conc.)/BW

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

Texas Pocket Gopher

COC	Maximum Surface Water Conc (mg/L)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	3.2E+01	3.8E-02	1.2E+00	3.0E-01	1.0E+00	2.9E-01
Barium	6.4E-01	2.9E+03	1.6E-01	4.6E+02	5.4E+01	5.2E+01	1.0E+00
Cadmium	8.0E-04	6.7E+01	5.9E-01	3.9E+01	3.6E+00	7.7E-01	4.6E+00
Chromium	6.4E-04	1.5E+01	4.1E-02	5.9E-01	1.4E-01	2.4E+00	5.7E-02
Copper	3.4E-03	4.8E+02	1.2E-01	5.9E+01	7.6E+00	5.6E+00	1.4E+00
Lead	2.4E-03	8.6E+02	2.7E-01	2.3E+02	2.4E+01	4.7E+00	5.0E+00
Manganese	2.7E+00	5.8E+02	7.9E-02	4.6E+01	7.6E+00	5.2E+01	1.5E-01
Nickel	1.2E-02	1.1E+01	1.8E-02	1.9E-01	8.2E-02	1.7E+00	4.8E-02
Selenium	4.8E-03	1.3E+01	6.7E-01	8.6E+00	7.7E-01	1.4E-01	5.4E+00
Silver	7.0E-04	1.0E+01	1.4E-02	1.4E-01	7.4E-02	6.0E+00	1.2E-02
Vanadium	9.0E-03	2.5E+01	4.9E-03	1.2E-01	1.7E-01	3.4E+00	4.9E-02
Zinc	5.4E-02	1.4E+04	3.7E-01	5.0E+03	4.9E+02	7.5E+01	6.4E+00
Mercury	7.4E-05	5.8E+01	6.5E-01	3.8E+01	3.4E+00	3.8E-01	8.9E+00
4,4'-DDD	5.6E-06	Not detected in subsurface			--		NA
4,4'-DDT	4.8E-05	3.0E-03	6.2E-02	1.9E-04	3.9E-05	1.5E-01	2.6E-04
Aldrin	2.9E-05	Not detected in subsurface			--		NA
beta-BHC	6.1E-05	1.2E-02	2.0E-03	2.3E-05	8.2E-05	4.0E+00	2.1E-05
Endrin aldehyde	1.4E-05	Not detected in subsurface			--		NA
Total PCBs	2.0E-04	3.6E-02	1.7E-01	6.1E-03	7.3E-04	2.0E-01	3.7E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	5.3E-02	7.0E-02	3.7E-03	7.4E-04	4.4E+01	1.7E-05
High Molecular Weight PAHs	5.0E-04	3.0E+00	3.4E-01	1.0E+00	9.9E-02	6.2E-01	1.6E-01
Pentachlorophenol	5.0E-05	1.2E-02	5.9E+00	7.1E-02	5.8E-03	5.0E+00	1.2E-03
Cyanide	4.0E-03	2.3E+00	1.3E-01	3.0E-01	3.8E-02	6.9E+01	5.6E-04

Texas pocket gopher consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Texas pocket gopher is exposed to the 1-2 foot soil zone only.

North Pit Soil - Conservative Analysis
Brine Service Company Superfund Site

North Pit (Conservative Analysis)										
Soil										
Nine-banded Armadillo										
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil Conc (0-0.5 foot) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	3.2E+01	2.24E-01	1.95E+00	3.8E-02	3.3E-01	3.8E-01	1.04E+00	3.69E-01
Barium	6.4E-01	1.2E+04	1.2E+04	9.10E-02	1.07E+03	1.6E-01	1.8E+03	1.66E+02	5.20E+01	3.19E+00
Cadmium	8.0E-04	1.6E+01	6.7E+01	7.71E+00	1.20E+02	5.9E-01	9.1E+00	6.33E+00	7.70E-01	8.22E+00
Chromium	6.4E-04	6.2E+01	6.2E+01	3.06E-01	1.89E+01	4.1E-02	2.5E+00	1.46E+00	2.40E+00	6.08E-01
Copper	3.4E-03	3.5E+01	4.8E+02	5.15E-01	1.78E+01	1.2E-01	4.3E+00	5.10E+00	5.60E+00	9.11E-01
Lead	2.4E-03	1.8E+03	1.8E+03	3.89E-02	7.00E+01	2.7E-01	4.8E+02	2.19E+01	4.70E+00	4.66E+00
Manganese	2.7E+00	3.8E+02	5.8E+02	5.40E-02	2.05E+01	7.9E-02	3.0E+01	6.57E+00	5.15E+01	1.28E-01
Nickel	1.2E-02	1.5E+01	1.5E+01	1.06E+00	1.63E+01	1.8E-02	2.8E-01	9.11E-01	1.70E+00	5.36E-01
Selenium	4.8E-03	1.2E+01	1.3E+01	9.85E-01	1.18E+01	6.7E-01	8.1E+00	7.15E-01	1.43E-01	5.00E+00
Silver	7.0E-04	6.4E-01	1.0E+01	2.05E+00	1.31E+00	1.4E-02	9.0E-03	1.53E-01	6.02E+00	2.54E-02
Vanadium	9.0E-03	2.5E+01	2.5E+01	4.20E-02	1.07E+00	4.9E-03	1.2E-01	2.79E-01	3.43E+00	8.12E-02
Zinc	5.4E-02	2.4E+03	1.4E+04	3.20E+00	7.78E+03	3.7E-01	8.9E+02	4.94E+02	7.54E+01	6.56E+00
Mercury	7.4E-05	9.0E+00	5.8E+01	1.69E+00	1.52E+01	6.5E-01	5.8E+00	1.27E+00	3.80E-01	3.33E+00
4,4'-DDD	5.6E-06	4.5E-02	4.5E-02	3.24E+00	1.46E-01	1.8E-01	7.9E-03	7.33E-03	1.47E-01	4.99E-02
4,4'-DDT	4.8E-05	1.0E-02	1.0E-02	9.95E+00	9.95E-02	6.2E-02	6.2E-04	4.80E-03	1.47E-01	3.26E-02
Aldrin	2.9E-05	2.4E-02	2.4E-02	9.74E+01	2.34E+00	2.2E-01	5.3E-03	1.11E-01	1.50E-02	7.38E+00
beta-BHC	6.1E-05	2.4E-03	1.2E-02	3.00E-01	7.20E-04	2.0E-03	4.7E-06	1.46E-04	4.00E+00	3.66E-05
Endrin	2.5E-05	6.1E-02	6.1E-02	3.69E+01	2.25E+00	5.8E-03	3.5E-04	1.07E-01	6.50E-02	1.64E+00
Endrin aldehyde	1.4E-05	2.0E-02	2.0E-02	4.70E+00	9.40E-02	6.8E-01	1.4E-02	4.69E-03	6.50E-02	7.22E-02
Total PCBs	2.0E-04	3.3E-02	3.6E-02	2.80E-01	9.10E-03	1.7E-01	5.5E-03	8.01E-04	2.00E-01	4.00E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	8.4E+01	6.70E-01	5.63E+01	7.0E-02	5.9E+00	3.44E+00	4.40E+01	7.82E-02
High Molecular Weight PAHs	5.0E-04	2.6E+00	3.0E+00	1.77E+00	4.57E+00	3.4E-01	8.8E-01	2.47E-01	6.15E-01	4.02E-01
Pentachlorophenol	5.0E-05	1.0E-05	1.2E-02	1.46E+01	1.46E-04	5.9E+00	5.9E-05	1.19E-04	5.00E+00	2.37E-05
Cyanide	4.0E-03	3.4E+01	3.4E+01	3.01E-01	1.03E+01	1.3E-01	4.4E+00	8.18E-01	6.87E+01	1.19E-02

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Placeholder value of 0.00001 mg/kg for surface soil concentration of pentachlorophenol

North Pit Soil - Conservative Analysis

Brine Service Company Superfund Site

North Pit (Conservative Analysis)

Soil

Texas Indigo Snake

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Arsenic	1.6E-02	8.7E+00	2.5E-03	2.2E-02	1.8E-03	2.2E-01	7.9E-03
Barium	6.4E-01	1.2E+04	5.7E-02	6.7E+02	6.6E+00	2.1E+00	3.2E+00
Cadmium	8.0E-04	1.6E+01	5.2E-01	8.1E+00	5.7E-02	1.5E-01	3.9E-01
Chromium	6.4E-04	6.2E+01	8.5E-02	5.2E+00	4.6E-02	2.7E-01	1.7E-01
Copper	3.4E-03	3.5E+01	2.4E-01	8.3E+00	6.2E-02	4.1E-01	1.5E-01
Lead	2.4E-03	1.8E+03	7.4E-02	1.3E+02	1.2E+00	2.0E-01	6.1E+00
Manganese	2.7E+00	3.8E+02	2.1E-02	7.8E+00	1.2E-01	1.8E+01	6.8E-03
Nickel	1.2E-02	1.5E+01	1.1E-01	1.8E+00	1.5E-02	6.7E-01	2.2E-02
Selenium	4.8E-03	1.2E+01	5.2E-01	6.3E+00	4.4E-02	2.9E-02	1.5E+00
Silver	7.0E-04	6.4E-01	4.0E-03	2.6E-03	1.4E-04	2.0E-01	6.7E-04
Vanadium	9.0E-03	2.5E+01	1.2E-02	3.1E-01	6.8E-03	9.9E-02	6.9E-02
Zinc	5.4E-02	2.4E+03	5.7E-01	1.4E+03	9.6E+00	6.6E+00	1.5E+00
Mercury	7.4E-05	9.0E+00	5.4E-02	4.9E-01	4.9E-03	4.5E-02	1.1E-01
4,4'-DDD	5.6E-06	4.5E-02	1.8E+00	8.1E-02	5.5E-04	2.3E-02	2.4E-02
4,4'-DDT	4.8E-05	1.0E-02	2.0E+00	2.0E-02	1.4E-04	2.3E-02	6.0E-03
Aldrin	2.9E-05	2.4E-02	2.4E+01	5.7E-01	3.8E-03	7.1E-03	5.3E-01
beta-BHC	6.1E-05	2.4E-03	1.5E+00	3.5E-03	2.4E-05	4.0E-01	5.9E-05
Endrin	2.5E-05	6.1E-02	4.9E+00	3.0E-01	2.0E-03	1.0E-02	1.9E-01
Endrin aldehyde	1.4E-05	2.0E-02	1.5E+00	2.9E-02	2.0E-04	1.0E-02	1.9E-02
Total PCBs	2.0E-04	3.3E-02	1.9E-01	6.2E-03	4.7E-05	4.0E-02	1.2E-03
Bis(2-ethylhexyl)phthalate	1.1E-03	8.4E+01	1.0E-01	8.4E+00	7.1E-02	3.5E-02	2.1E+00
High Molecular Weight PAHs	5.0E-04	2.6E+00	1.0E-05	2.6E-05	4.8E-04	2.0E-01	2.4E-03
Pentachlorophenol		only detected in subsurface soil					
Cyanide	4.0E-03	3.4E+01	4.1E-02	1.4E+00	1.6E-02	6.5E-02	2.4E-01

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

SLERA NOAEL HQ Summary for Terrestrial Species at North Area Soils Conservative Analysis

Terrestrial										
SLERA North Pit (Conservative Analysis)										
Soil										
COPC	Red-Tailed Hawk	American Robin	Mourning Dove	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake
Arsenic	7.4E-03	1.0E-01	6.3E-02	1.8E-01	6.5E-02	1.2E-02	3.5E-01	2.9E-01	3.7E-01	7.9E-03
Barium	2.8E+00	1.4E+01	1.7E+01	4.6E+00	3.5E+00	8.2E-01	5.2E+00	1.0E+00	3.2E+00	3.2E+00
Cadmium	3.4E-01	6.3E+00	8.8E-01	1.2E+01	8.9E-01	4.8E-01	2.2E+01	4.6E+00	8.2E+00	3.9E-01
Chromium	1.5E-01	7.5E-01	3.8E-01	7.1E-01	2.0E-01	1.2E-01	1.4E+00	5.7E-02	6.1E-01	1.7E-01
Copper	1.3E-01	4.5E-01	2.3E-01	3.0E-01	8.2E-02	7.1E-02	5.1E-01	1.4E+00	9.1E-01	1.5E-01
Lead	6.5E+00	3.2E+01	4.8E+01	9.4E+00	8.7E+00	1.7E+00	5.9E+00	5.0E+00	4.7E+00	6.1E+00
Manganese	6.9E-03	3.8E-02	4.6E-02	9.8E-02	8.3E-02	1.9E-02	1.4E-01	1.5E-01	1.3E-01	6.8E-03
Nickel	1.9E-02	1.9E-01	3.1E-02	7.2E-01	5.8E-02	5.6E-02	1.4E+00	4.8E-02	5.4E-01	2.2E-02
Selenium	1.3E+00	5.2E+00	3.9E+00	1.0E+01	4.2E+00	2.0E+00	1.3E+01	5.4E+00	5.0E+00	1.5E+00
Silver	6.2E-04	4.9E-02	4.2E-03	1.6E-02	6.6E-04	1.5E-04	3.2E-02	1.2E-02	2.5E-02	6.7E-04
Vanadium	6.1E-02	2.8E-01	3.1E-01	4.6E-02	4.0E-02	1.3E-02	1.2E-01	4.9E-02	8.1E-02	6.9E-02
Zinc	1.3E+00	9.6E+00	2.1E+00	8.2E+00	9.5E-01	8.3E-01	1.5E+01	6.4E+00	6.6E+00	1.5E+00
Mercury	9.5E-02	3.5E+00	1.8E+00	4.0E+00	1.1E+00	8.3E-02	5.9E+00	8.9E+00	3.3E+00	1.1E-01
4,4'-DDD	2.1E-02	5.0E-02	6.5E-03	7.5E-02	5.2E-03	2.4E-02	1.4E-01	--	5.0E-02	2.4E-02
4,4'-DDT	5.2E-03	3.2E-02	8.6E-04	4.9E-02	6.7E-04	6.1E-03	9.6E-02	2.6E-04	3.3E-02	6.0E-03
Hazard Index: DDT and DDD	2.6E-02	8.1E-02	7.4E-03	1.2E-01	5.8E-03	3.0E-02	2.4E-01	2.6E-04	8.3E-02	3.0E-02
Aldrin	4.6E-01	2.4E+00	1.3E-02	1.1E+01	3.2E-02	1.6E+00	2.2E+01	--	7.4E+00	5.3E-01
beta-BHC	5.2E-05	2.0E-05	8.8E-06	1.7E-05	5.0E-06	3.9E-05	3.4E-05	2.1E-05	3.7E-05	5.9E-05
Endrin	1.7E-01	1.6E+00	7.1E-03	2.5E+00	5.2E-03	2.0E-01	4.9E+00	--	1.6E+00	1.9E-01
Endrin aldehyde	1.7E-02	7.5E-02	1.8E-02	1.2E-01	1.6E-02	2.0E-02	2.1E-01	--	7.2E-02	1.9E-02
Total PCBs	1.1E-03	3.3E-03	2.6E-03	5.8E-03	2.8E-03	1.6E-03	8.2E-03	3.7E-03	4.0E-03	1.2E-03
Bis(2-ethylhexyl)phthalate	1.8E+00	1.4E+01	4.8E+00	1.1E-01	1.9E-02	1.0E-02	2.0E-01	1.7E-05	7.8E-02	2.1E+00
High Molecular Weight PAHs	2.1E-03	2.0E-01	1.5E-02	6.4E-01	1.2E-01	5.1E-03	1.1E+00	1.6E-01	4.0E-01	2.4E-03
Pentachlorophenol	--	--	--	--	--	--	--	1.2E-03	2.4E-05	--
Cyanide	2.1E-01	2.0E+00	1.4E+00	1.7E-02	6.8E-03	1.5E-03	2.6E-02	5.6E-04	1.2E-02	2.4E-01

East Ditch Riparian Soils (South)
SLERA HQ Calculations
Conservative Analysis
EPC = maximum detected concentration
AUF = 1
NOAEL-based HQs

East Ditch Riparian Soil (South)
Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus</i> Linneaus	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	3.16E-01	j	NA	2.8	d	8.86E-03	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. Physiol. Zool. 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Petersen et al. 1998, food ingestion assumed to be 14% of body weight per day. (2.26 kg x 0.14 = 0.316 kg/day)										

East Ditch Riparian Soil (South)
Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial	Terrestrial	Terrestrial
	Plants	Invertebrates	Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

East Ditch Riparian Soils (South) - Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	East Ditch Riparian Soil (South)			
Document Type:	SLERA			
Location:	East Ditch Riparian Soil (South)			
Risk from which Medium:	Soil (Conservative HQs)			
Surface Water Data:	Surface Water data from North Portion of East Ditch			
COPCs	Maximum Surface Water Conc. (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)
Barium	6.39E-01	4.67E+02	1.31E+03	1.31E+03
Cadmium	8.00E-04	2.14E-01	4.56E-01	4.56E-01
Chromium	6.41E-04	5.86E+00	7.35E+00	7.35E+00
Copper	3.44E-03	6.04E+00	1.37E+01	1.37E+01
Cyanide	4.00E-03	4.55E+00	1.20E+00	4.55E+00
Lead	2.38E-03	1.05E+01	8.48E+01	8.48E+01
Manganese	2.70E+00	2.20E+02	2.97E+02	2.97E+02
Mercury	7.40E-05	1.33E-02	2.44E-02	2.44E-02
Nickel	1.22E-02	5.51E+00	6.95E+00	6.95E+00
Selenium	4.76E-03	1.19E+00	1.43E+00	1.43E+00
Zinc	5.42E-02	2.59E+01	7.29E+01	7.29E+01
4,4'-DDT	4.80E-05	2.90E-03	5.80E-04	2.90E-03
Maximum detection limit in surface water used as surface water concentration if COPC not detected.				

East Ditch Riparian Soils (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Red-tailed Hawk

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	5.7E-02	2.6E+01	2.3E+00	2.1E+01	1.1E-01
Cadmium	8.0E-04	2.1E-01	5.2E-01	1.1E-01	6.8E-03	1.5E+00	4.6E-03
Chromium	6.4E-04	5.9E+00	8.5E-02	5.0E-01	3.8E-02	2.7E+00	1.4E-02
Copper	3.4E-03	6.0E+00	2.4E-01	1.5E+00	9.4E-02	4.1E+00	2.3E-02
Lead	2.4E-03	1.1E+01	7.4E-02	7.7E-01	6.2E-02	1.6E+00	3.8E-02
Manganese	2.7E+00	2.2E+02	2.1E-02	4.5E+00	7.8E-01	1.8E+02	4.4E-03
Nickel	1.2E-02	5.5E+00	1.1E-01	6.3E-01	4.6E-02	6.7E+00	6.8E-03
Selenium	4.8E-03	1.2E+00	5.2E-01	6.2E-01	3.8E-02	2.9E-01	1.3E-01
Zinc	5.42E-02	2.6E+01	5.7E-01	1.5E+01	8.9E-01	6.6E+01	1.4E-02
Mercury	7.40E-05	1.3E-02	5.4E-02	7.2E-04	6.8E-05	4.5E-01	1.5E-04
4,4'-DDT	4.80E-05	2.9E-03	2.0E+00	5.9E-03	3.5E-04	2.3E-01	1.5E-03
Cyanide	4.00E-03	4.6E+00	4.1E-02	1.9E-01	1.8E-02	6.5E-01	2.8E-02

Hawk consumes 100% terrestrial mammals in model.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

American Robin

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	9.10E-02	4.25E+01	1.6E-01	7.3E+01	1.2E+01	2.08E+01	5.65E-01
Cadmium	8.0E-04	2.1E-01	7.71E+00	1.65E+00	5.9E-01	1.3E-01	1.28E-01	1.47E+00	8.71E-02
Chromium	6.4E-04	5.9E+00	3.06E-01	1.79E+00	4.1E-02	2.4E-01	1.88E-01	2.66E+00	7.07E-02
Copper	3.4E-03	6.0E+00	5.15E-01	3.11E+00	1.2E-01	7.5E-01	3.20E-01	4.05E+00	7.90E-02
Lead	2.4E-03	1.1E+01	3.89E-02	4.08E-01	2.7E-01	2.8E+00	3.06E-01	1.63E+00	1.88E-01
Manganese	2.7E+00	2.2E+02	5.40E-02	1.19E+01	7.9E-02	1.7E+01	4.10E+00	1.79E+02	2.29E-02
Nickel	1.2E-02	5.5E+00	1.06E+00	5.84E+00	1.8E-02	9.9E-02	4.65E-01	6.71E+00	6.93E-02
Selenium	4.8E-03	1.2E+00	9.85E-01	1.17E+00	6.7E-01	8.0E-01	1.50E-01	2.90E-01	5.16E-01
Zinc	5.4E-02	2.6E+01	3.20E+00	8.29E+01	3.7E-01	9.5E+00	6.77E+00	6.61E+01	1.02E-01
Mercury	7.4E-05	1.3E-02	1.69E+00	2.25E-02	6.5E-01	8.7E-03	2.33E-03	4.50E-01	5.17E-03
4,4'-DDT	4.8E-05	2.9E-03	9.95E+00	2.89E-02	6.2E-02	1.8E-04	2.09E-03	2.27E-01	9.23E-03
Cyanide	4.0E-03	4.6E+00	3.01E-01	1.37E+00	1.3E-01	5.9E-01	1.73E-01	6.53E-01	2.66E-01

Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Mourning Dove

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	1.6E-01	7.3E+01	1.4E+01	2.1E+01	6.8E-01
Cadmium	8.0E-04	2.1E-01	5.9E-01	1.3E-01	1.8E-02	1.5E+00	1.2E-02
Chromium	6.4E-04	5.9E+00	4.1E-02	2.4E-01	9.6E-02	2.7E+00	3.6E-02
Copper	3.4E-03	6.0E+00	1.2E-01	7.5E-01	1.6E-01	4.1E+00	4.0E-02
Lead	2.4E-03	1.1E+01	2.7E-01	2.8E+00	4.6E-01	1.6E+00	2.8E-01
Manganese	2.7E+00	2.2E+02	7.9E-02	1.7E+01	4.9E+00	1.8E+02	2.8E-02
Nickel	1.2E-02	5.5E+00	1.8E-02	9.9E-02	7.6E-02	6.7E+00	1.1E-02
Selenium	4.8E-03	1.2E+00	6.7E-01	8.0E-01	1.1E-01	2.9E-01	3.8E-01
Zinc	5.4E-02	2.6E+01	3.7E-01	9.5E+00	1.5E+00	6.6E+01	2.2E-02
Mercury	7.4E-05	1.3E-02	6.5E-01	8.7E-03	1.2E-03	4.5E-01	2.7E-03
4,4'-DDT	4.8E-05	2.9E-03	6.2E-02	1.8E-04	6.1E-05	2.3E-01	2.7E-04
Cyanide	4.0E-03	4.6E+00	1.3E-01	5.9E-01	1.2E-01	6.5E-01	1.9E-01

Mourning Dove consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis
Brine Service Company Superfund Site

East Ditch Riparian Soil (South)									
Soil (Conservative HQs)									
Red-winged Blackbird									
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	9.10E-02	4.25E+01	1.6E-01	7.3E+01	1.31E+01	2.08E+01	6.3E-01
Cadmium	8.0E-04	2.1E-01	7.71E+00	1.65E+00	5.9E-01	1.3E-01	9.53E-02	1.47E+00	6.5E-02
Chromium	6.4E-04	5.9E+00	3.06E-01	1.79E+00	4.1E-02	2.4E-01	1.37E-01	2.66E+00	5.1E-02
Copper	3.4E-03	6.0E+00	5.15E-01	3.11E+00	1.2E-01	7.5E-01	2.66E-01	4.05E+00	6.6E-02
Lead	2.4E-03	1.1E+01	3.89E-02	4.08E-01	2.7E-01	2.8E+00	4.15E-01	1.63E+00	2.5E-01
Manganese	2.7E+00	2.2E+02	5.40E-02	1.19E+01	7.9E-02	1.7E+01	4.03E+00	1.79E+02	2.3E-02
Nickel	1.2E-02	5.5E+00	1.06E+00	5.84E+00	1.8E-02	9.9E-02	3.11E-01	6.71E+00	4.6E-02
Selenium	4.8E-03	1.2E+00	9.85E-01	1.17E+00	6.7E-01	8.0E-01	1.63E-01	2.90E-01	5.6E-01
Zinc	5.4E-02	2.6E+01	3.20E+00	8.29E+01	3.7E-01	9.5E+00	5.26E+00	6.61E+01	8.0E-02
Mercury	7.4E-05	1.3E-02	1.69E+00	2.25E-02	6.5E-01	8.7E-03	2.24E-03	4.50E-01	5.0E-03
4,4'-DDT	4.8E-05	2.9E-03	9.95E+00	2.89E-02	6.2E-02	1.8E-04	1.41E-03	2.27E-01	6.2E-03
Cyanide	4.0E-03	4.6E+00	3.01E-01	1.37E+00	1.3E-01	5.9E-01	1.57E-01	6.53E-01	2.4E-01

Red-winged blackbird consumes 73% terrestrial plants and 27% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.73) + (FI x Soil Conc. X UFinverts x 0.27) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	9.10E-02	4.25E+01	1.6E-01	7.3E+01	9.6E+00	5.20E+01	1.8E-01
Cadmium	8.0E-04	2.1E-01	7.71E+00	1.65E+00	5.9E-01	1.3E-01	1.27E-01	7.70E-01	1.6E-01
Chromium	6.4E-04	5.9E+00	3.06E-01	1.79E+00	4.1E-02	2.4E-01	1.61E-01	2.40E+00	6.7E-02
Copper	3.4E-03	6.0E+00	5.15E-01	3.11E+00	1.2E-01	7.5E-01	2.91E-01	5.60E+00	5.2E-02
Lead	2.4E-03	1.1E+01	3.89E-02	4.08E-01	2.7E-01	2.8E+00	2.57E-01	4.70E+00	5.5E-02
Manganese	2.7E+00	2.2E+02	5.40E-02	1.19E+01	7.9E-02	1.7E+01	3.10E+00	5.15E+01	6.0E-02
Nickel	1.2E-02	5.5E+00	1.06E+00	5.84E+00	1.8E-02	9.9E-02	4.38E-01	1.70E+00	2.6E-01
Selenium	4.8E-03	1.2E+00	9.85E-01	1.17E+00	6.7E-01	8.0E-01	1.44E-01	1.43E-01	1.0E+00
Zinc	5.4E-02	2.6E+01	3.20E+00	8.29E+01	3.7E-01	9.5E+00	6.64E+00	7.54E+01	8.8E-02
Mercury	7.4E-05	1.3E-02	1.69E+00	2.25E-02	6.5E-01	8.7E-03	2.26E-03	3.80E-01	6.0E-03
4,4'-DDT	4.8E-05	2.9E-03	9.95E+00	2.89E-02	6.2E-02	1.8E-04	2.08E-03	1.47E-01	1.4E-02
Cyanide	4.0E-03	4.6E+00	3.01E-01	1.37E+00	1.3E-01	5.9E-01	1.52E-01	6.87E+01	2.2E-03

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Eastern Cottontail

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	1.6E-01	7.3E+01	7.3E+00	5.2E+01	1.4E-01
Cadmium	8.0E-04	2.1E-01	5.9E-01	1.3E-01	9.5E-03	7.7E-01	1.2E-02
Chromium	6.4E-04	5.9E+00	4.1E-02	2.4E-01	4.6E-02	2.4E+00	1.9E-02
Copper	3.4E-03	6.0E+00	1.2E-01	7.5E-01	8.1E-02	5.6E+00	1.4E-02
Lead	2.4E-03	1.1E+01	2.7E-01	2.8E+00	2.4E-01	4.7E+00	5.1E-02
Manganese	2.7E+00	2.2E+02	7.9E-02	1.7E+01	2.6E+00	5.2E+01	5.1E-02
Nickel	1.2E-02	5.5E+00	1.8E-02	9.9E-02	3.6E-02	1.7E+00	2.1E-02
Selenium	4.8E-03	1.2E+00	6.7E-01	8.0E-01	6.0E-02	1.4E-01	4.2E-01
Zinc	5.4E-02	2.6E+01	3.7E-01	9.5E+00	7.7E-01	7.5E+01	1.0E-02
Mercury	7.4E-05	1.3E-02	6.5E-01	8.7E-03	6.5E-04	3.8E-01	1.7E-03
4,4'-DDT	4.8E-05	2.9E-03	6.2E-02	1.8E-04	3.3E-05	1.5E-01	2.2E-04
Cyanide	4.0E-03	4.6E+00	1.3E-01	5.9E-01	6.3E-02	6.9E+01	9.1E-04

Eastern Cottontail consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South) Soil (Conservative HQs) Coyote

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	5.7E-02	2.6E+01	1.7E+00	5.2E+01	3.3E-02
Cadmium	8.0E-04	2.1E-01	5.2E-01	1.1E-01	5.1E-03	7.7E-01	6.6E-03
Chromium	6.4E-04	5.9E+00	8.5E-02	5.0E-01	2.8E-02	2.4E+00	1.2E-02
Copper	3.4E-03	6.0E+00	2.4E-01	1.5E+00	7.0E-02	5.6E+00	1.2E-02
Lead	2.4E-03	1.1E+01	7.4E-02	7.7E-01	4.6E-02	4.7E+00	9.8E-03
Manganese	2.7E+00	2.2E+02	2.1E-02	4.5E+00	6.6E-01	5.2E+01	1.3E-02
Nickel	1.2E-02	5.5E+00	1.1E-01	6.3E-01	3.4E-02	1.7E+00	2.0E-02
Selenium	4.8E-03	1.2E+00	5.2E-01	6.2E-01	2.8E-02	1.4E-01	2.0E-01
Zinc	5.4E-02	2.6E+01	5.7E-01	1.5E+01	6.7E-01	7.5E+01	8.9E-03
Mercury	7.4E-05	1.3E-02	5.4E-02	7.2E-04	5.3E-05	3.8E-01	1.4E-04
4,4'-DDT	4.8E-05	2.9E-03	2.0E+00	5.9E-03	2.6E-04	1.5E-01	1.8E-03
Cyanide	4.0E-03	4.6E+00	4.1E-02	1.9E-01	1.4E-02	6.9E+01	2.0E-04

Coyote consumes 100% terrestrial mammals.
Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Least Shrew

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	9.1E-02	4.2E+01	1.1E+01	5.2E+01	2.1E-01
Cadmium	8.0E-04	2.1E-01	7.7E+00	1.6E+00	2.4E-01	7.7E-01	3.1E-01
Chromium	6.4E-04	5.9E+00	3.1E-01	1.8E+00	3.1E-01	2.4E+00	1.3E-01
Copper	3.4E-03	6.0E+00	5.2E-01	3.1E+00	5.0E-01	5.6E+00	8.9E-02
Lead	2.4E-03	1.1E+01	3.9E-02	4.1E-01	1.6E-01	4.7E+00	3.4E-02
Manganese	2.7E+00	2.2E+02	5.4E-02	1.2E+01	4.3E+00	5.2E+01	8.3E-02
Nickel	1.2E-02	5.5E+00	1.1E+00	5.8E+00	8.8E-01	1.7E+00	5.2E-01
Selenium	4.8E-03	1.2E+00	9.9E-01	1.2E+00	1.8E-01	1.4E-01	1.2E+00
Zinc	5.4E-02	2.6E+01	3.2E+00	8.3E+01	1.2E+01	7.5E+01	1.6E-01
Mercury	7.4E-05	1.3E-02	1.7E+00	2.3E-02	3.3E-03	3.8E-01	8.7E-03
4,4'-DDT	4.8E-05	2.9E-03	1.0E+01	2.9E-02	4.1E-03	1.5E-01	2.8E-02
Cyanide	4.0E-03	4.6E+00	3.0E-01	1.4E+00	2.4E-01	6.9E+01	3.5E-03

Least Shrew consumes 100% terrestrial plants

Dose = (WI x Water Conc) + (FI x Soil Conc. X UF_{Invertebrates} x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Texas Pocket Gopher

COC	Maximum Surface Water Conc (mg/L)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.3E+03	1.6E-01	2.0E+02	2.4E+01	5.2E+01	4.7E-01
Cadmium	8.0E-04	4.6E-01	5.9E-01	2.7E-01	2.4E-02	7.7E-01	3.2E-02
Chromium	6.4E-04	7.4E+00	4.1E-02	3.0E-01	6.9E-02	2.4E+00	2.9E-02
Copper	3.4E-03	1.4E+01	1.2E-01	1.7E+00	2.2E-01	5.6E+00	3.9E-02
Lead	2.4E-03	8.5E+01	2.7E-01	2.3E+01	2.3E+00	4.7E+00	5.0E-01
Manganese	2.7E+00	3.0E+02	7.9E-02	2.4E+01	4.0E+00	5.2E+01	7.8E-02
Nickel	1.2E-02	7.0E+00	1.8E-02	1.3E-01	5.4E-02	1.7E+00	3.2E-02
Selenium	4.8E-03	1.4E+00	6.7E-01	9.6E-01	8.6E-02	1.4E-01	6.0E-01
Zinc	5.4E-02	7.3E+01	3.7E-01	2.7E+01	2.6E+00	7.5E+01	3.4E-02
Mercury	7.4E-05	2.4E-02	6.5E-01	1.6E-02	1.4E-03	3.8E-01	3.8E-03
4,4'-DDT	4.8E-05	5.8E-04	6.2E-02	3.6E-05	1.2E-05	1.5E-01	7.9E-05
Cyanide	4.0E-03	1.2E+00	1.3E-01	1.5E-01	2.0E-02	6.9E+01	2.9E-04

Texas pocket gopher consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Texas pocket gopher is exposed to the 1-2 foot soil zone only.

East Ditch Riparian Soil (South) - Conservative Analysis
Brine Service Company Superfund Site

East Ditch Riparian Soil (South) Soil (Conservative HQs) Nine-banded Armadillo										
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	1.3E+03	9.10E-02	4.25E+01	1.6E-01	7.3E+01	1.4E+01	5.20E+01	2.72E-01
Cadmium	8.0E-04	2.1E-01	4.6E-01	7.71E+00	1.65E+00	5.9E-01	1.3E-01	8.3E-02	7.70E-01	1.07E-01
Chromium	6.4E-04	5.9E+00	7.4E+00	3.06E-01	1.79E+00	4.1E-02	2.4E-01	1.5E-01	2.40E+00	6.32E-02
Copper	3.4E-03	6.0E+00	1.4E+01	5.15E-01	3.11E+00	1.2E-01	7.5E-01	2.7E-01	5.60E+00	4.88E-02
Lead	2.4E-03	1.1E+01	8.5E+01	3.89E-02	4.08E-01	2.7E-01	2.8E+00	7.9E-01	4.70E+00	1.68E-01
Manganese	2.7E+00	2.2E+02	3.0E+02	5.40E-02	1.19E+01	7.9E-02	1.7E+01	3.5E+00	5.15E+01	6.86E-02
Nickel	1.2E-02	5.5E+00	7.0E+00	1.06E+00	5.84E+00	1.8E-02	9.9E-02	3.4E-01	1.70E+00	2.00E-01
Selenium	4.8E-03	1.2E+00	1.4E+00	9.85E-01	1.17E+00	6.7E-01	8.0E-01	7.3E-02	1.43E-01	5.09E-01
Zinc	5.4E-02	2.6E+01	7.3E+01	3.20E+00	8.29E+01	3.7E-01	9.5E+00	4.6E+00	7.54E+01	6.13E-02
Mercury	7.4E-05	1.3E-02	2.4E-02	1.69E+00	2.25E-02	6.5E-01	8.7E-03	1.3E-03	3.80E-01	3.51E-03
4,4'-DDT	4.8E-05	2.9E-03	2.9E-03	9.95E+00	2.89E-02	6.2E-02	1.8E-04	1.4E-03	1.47E-01	9.49E-03
Cyanide	4.0E-03	4.6E+00	4.6E+00	3.01E-01	1.37E+00	1.3E-01	5.9E-01	1.1E-01	6.87E+01	1.58E-03

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Since heptachlor and 2,4-dimethylphenol were not detected in surface soil the 0-2 foot concentration was used to estimate food concentrations.

East Ditch Riparian Soil (South) - Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Conservative HQs)

Texas Indigo Snake

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	5.7E-02	2.6E+01	5.5E+00	2.1E+00	2.7E+00
Cadmium	8.0E-04	2.1E-01	5.2E-01	1.1E-01	1.6E-02	1.5E-01	1.1E-01
Chromium	6.4E-04	5.9E+00	8.5E-02	5.0E-01	9.2E-02	2.7E-01	3.5E-01
Copper	3.4E-03	6.0E+00	2.4E-01	1.5E+00	2.3E-01	4.1E-01	5.6E-01
Lead	2.4E-03	1.1E+01	7.4E-02	7.7E-01	1.5E-01	1.6E-01	9.2E-01
Manganese	2.7E+00	2.2E+02	2.1E-02	4.5E+00	1.5E+00	1.8E+01	8.3E-02
Nickel	1.2E-02	5.5E+00	1.1E-01	6.3E-01	1.1E-01	6.7E-01	1.6E-01
Selenium	4.8E-03	1.2E+00	5.2E-01	6.2E-01	9.2E-02	2.9E-02	3.2E+00
Zinc	5.4E-02	2.6E+01	5.7E-01	1.5E+01	2.2E+00	6.6E+00	3.3E-01
Mercury	7.4E-05	1.3E-02	5.4E-02	7.2E-04	1.5E-04	4.5E-02	3.4E-03
4,4'-DDT	4.8E-05	2.9E-03	2.0E+00	5.9E-03	8.4E-04	2.3E-02	3.7E-02
Cyanide	4.0E-03	4.6E+00	4.1E-02	1.9E-01	4.4E-02	6.5E-02	6.7E-01

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

SLERA NOAEL HQ Summary for Terrestrial Species at South Area Soils Conservative Analysis

East Ditch Riparian Soil (South)												
SLERA												
East Ditch Riparian Soil (South)												
Soil (Conservative HQs)												
COPC	Red-Tailed Hawk	American Robin	Mourning Dove	Red-Winged Blackbird	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake	
	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ
Barium	1.1E-01	5.7E-01	6.8E-01	6.3E-01	1.8E-01	1.4E-01	3.3E-02	2.1E-01	4.7E-01	2.7E-01	2.7E+00	
Cadmium	4.6E-03	8.7E-02	1.2E-02	6.5E-02	1.6E-01	1.2E-02	6.6E-03	3.1E-01	3.2E-02	1.1E-01	1.1E-01	
Chromium	1.4E-02	7.1E-02	3.6E-02	5.1E-02	6.7E-02	1.9E-02	1.2E-02	1.3E-01	2.9E-02	6.3E-02	3.5E-01	
Copper	2.3E-02	7.9E-02	4.0E-02	6.6E-02	5.2E-02	1.4E-02	1.2E-02	8.9E-02	3.9E-02	4.9E-02	5.6E-01	
Lead	3.8E-02	1.9E-01	2.8E-01	2.5E-01	5.5E-02	5.1E-02	9.8E-03	3.4E-02	5.0E-01	1.7E-01	9.2E-01	
Manganese	4.4E-03	2.3E-02	2.8E-02	2.3E-02	6.0E-02	5.1E-02	1.3E-02	8.3E-02	7.8E-02	6.9E-02	8.3E-02	
Nickel	6.8E-03	6.9E-02	1.1E-02	4.6E-02	2.6E-01	2.1E-02	2.0E-02	5.2E-01	3.2E-02	2.0E-01	1.6E-01	
Selenium	1.3E-01	5.2E-01	3.8E-01	5.6E-01	1.0E+00	4.2E-01	2.0E-01	1.2E+00	6.0E-01	5.1E-01	3.2E+00	
Zinc	1.4E-02	1.0E-01	2.2E-02	8.0E-02	8.8E-02	1.0E-02	8.9E-03	1.6E-01	3.4E-02	6.1E-02	3.3E-01	
Mercury	1.5E-04	5.2E-03	2.7E-03	5.0E-03	6.0E-03	1.7E-03	1.4E-04	8.7E-03	3.8E-03	3.5E-03	3.4E-03	
4,4'-DDT	1.5E-03	9.2E-03	2.7E-04	6.2E-03	1.4E-02	2.2E-04	1.8E-03	2.8E-02	7.9E-05	9.5E-03	3.7E-02	
Cyanide	2.8E-02	2.7E-01	1.9E-01	2.4E-01	2.2E-03	9.1E-04	2.0E-04	3.5E-03	2.9E-04	1.6E-03	6.7E-01	

**East Ditch (South Segment) Sediment as Soil
SLERA HQ Calculations
Conservative Analysis
EPC = maximum detected concentration
AUF = 1
NOAEL-based HQs**

East Ditch (South Segment) Sediment as Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus</i> Linneaus	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais erebennus</i>	Carnivore	2.26	h	3.16E-01	j	NA	2.8	d	8.86E-03	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. <i>Physiol. Zool.</i> 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Petersen et al. 1998, food ingestion assumed to be 14% of body weight per day. (2.26 kg x 0.14 = 0.316 kg/day)										

East Ditch (South Segment) Sediment as Soil

Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial	Terrestrial	Terrestrial
	Plants	Invertebrates	Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

East Ditch (South Segment) Sediment as Soil - Conservative Analysis
 Brine Service Company Superfund Site

Habitat Type: East Ditch Sediment as Soil Document Type: SLERA Location: East Ditch (South Segment) Risk from which Medium: Sediment as Soil (Conservative HQs) Surface Water Data: Surface Water data from South Portion of East Ditch				
	Maximum Surface Water Conc. (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)
	COPCs			
Barium	3.01E-01	2,690	2,690	2,690
Cadmium	6.00E-04	3.32	3.32	3.32
Chromium	1.16E-03	11.90	11.90	11.90
Copper	4.79E-03	21.50	21.50	21.50
Lead	1.33E-03	77.00	77.00	77.00
Manganese	3.91E-01	559.00	559.00	559.00
Mercury	4.20E-05	0.25	0.25	0.25
Nickel	2.93E-03	8.53	8.53	8.53
Selenium	2.50E-03	0.76	0.76	0.76
Silver	7.00E-04	0.21	0.21	0.21
Vanadium	1.03E-02	19.80	19.80	19.80
Zinc	1.08E-02	545.00	545.00	545.00
4,4'-DDT	1.10E-05	0.02	0.02	0.02
beta-BHC	1.20E-06	0.04	0.04	0.04
gamma-Chlordane	8.30E-06	0.03	0.03	0.03
High Molecular Weight PAHs	6.40E-05	1.64	1.64	1.64
Maximum detection limit in surface water used as surface water concentration if COPC not detected.				

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Conservative HQs)

Red-tailed Hawk

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	5.7E-02	1.5E+02	1.3E+01	2.1E+01	6.3E-01
Cadmium	6.0E-04	3.3E+00	5.2E-01	1.7E+00	1.0E-01	1.5E+00	7.1E-02
Chromium	1.2E-03	1.2E+01	8.5E-02	1.0E+00	7.8E-02	2.7E+00	2.9E-02
Copper	4.8E-03	2.2E+01	2.4E-01	5.2E+00	3.3E-01	4.1E+00	8.2E-02
Lead	1.3E-03	7.7E+01	7.4E-02	5.7E+00	4.5E-01	1.6E+00	2.8E-01
Manganese	3.9E-01	5.6E+02	2.1E-02	1.1E+01	1.6E+00	1.8E+02	9.0E-03
Mercury	4.2E-05	2.5E-01	5.4E-02	1.4E-02	1.2E-03	4.5E-01	2.7E-03
Nickel	2.9E-03	8.5E+00	1.1E-01	9.7E-01	7.0E-02	6.7E+00	1.0E-02
Selenium	2.50E-03	7.6E-01	5.2E-01	3.9E-01	2.4E-02	2.9E-01	8.3E-02
Silver	7.00E-04	2.1E-01	4.0E-03	8.5E-04	4.4E-04	2.0E+00	2.2E-04
Vanadium	1.03E-02	2.0E+01	1.2E-02	2.4E-01	4.7E-02	9.9E-01	4.8E-02
Zinc	1.08E-02	5.5E+02	5.7E-01	3.1E+02	1.9E+01	6.6E+01	2.8E-01
4,4'-DDT	1.10E-05	2.4E-02	2.0E+00	4.9E-02	2.9E-03	2.3E-01	1.3E-02
beta-BHC	1.20E-06	4.0E-02	1.5E+00	5.8E-02	3.4E-03	4.0E+00	8.5E-04
gamma-Chlordane	8.30E-06	2.8E-02	1.5E+00	4.1E-02	2.4E-03	2.1E+00	1.1E-03
High Molecular Weight PAHs	6.40E-05	1.6E+00	1.0E-05	1.6E-05	2.7E-03	2.0E+00	1.4E-03

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Conservative HQs) American Robin									
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	9.10E-02	2.45E+02	1.6E-01	4.2E+02	6.7E+01	2.08E+01	3.23E+00
Cadmium	6.0E-04	3.3E+00	7.71E+00	2.56E+01	5.9E-01	1.9E+00	1.98E+00	1.47E+00	1.35E+00
Chromium	1.2E-03	1.2E+01	3.06E-01	3.64E+00	4.1E-02	4.9E-01	3.82E-01	2.66E+00	1.44E-01
Copper	4.8E-03	2.2E+01	5.15E-01	1.11E+01	1.2E-01	2.7E+00	1.14E+00	4.05E+00	2.81E-01
Lead	1.3E-03	7.7E+01	3.89E-02	3.00E+00	2.7E-01	2.0E+01	2.24E+00	1.63E+00	1.37E+00
Manganese	3.9E-01	5.6E+02	5.40E-02	3.02E+01	7.9E-02	4.4E+01	9.49E+00	1.79E+02	5.30E-02
Mercury	4.2E-05	2.5E-01	1.69E+00	4.23E-01	6.5E-01	1.6E-01	4.36E-02	4.50E-01	9.68E-02
Nickel	2.9E-03	8.5E+00	1.06E+00	9.03E+00	1.8E-02	1.5E-01	7.17E-01	6.71E+00	1.07E-01
Selenium	2.5E-03	7.6E-01	9.85E-01	7.46E-01	6.7E-01	5.1E-01	9.52E-02	2.90E-01	3.28E-01
Silver	7.0E-04	2.1E-01	2.05E+00	4.36E-01	1.4E-02	3.0E-03	3.29E-02	2.02E+00	1.63E-02
Vanadium	1.0E-02	2.0E+01	4.20E-02	8.32E-01	4.9E-03	9.6E-02	2.14E-01	9.88E-01	2.17E-01
Zinc	1.1E-02	5.5E+02	3.20E+00	1.74E+03	3.7E-01	2.0E+02	1.42E+02	6.61E+01	2.15E+00
4,4'-DDT	1.1E-05	2.4E-02	9.95E+00	2.39E-01	6.2E-02	1.5E-03	1.73E-02	2.27E-01	7.61E-02
beta-BHC	1.2E-06	4.0E-02	3.00E-01	1.20E-02	2.0E-03	7.8E-05	1.16E-03	4.00E+00	2.89E-04
gamma-Chlordane	8.3E-06	2.8E-02	2.87E+01	8.04E-01	1.6E-01	4.5E-03	5.77E-02	2.14E+00	2.70E-02
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.77E+00	2.90E+00	3.4E-01	5.6E-01	2.58E-01	2.00E+00	1.29E-01

Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)
Sediment as Soil (Conservative HQs)
Mourning Dove

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	1.6E-01	4.2E+02	8.2E+01	2.1E+01	3.9E+00
Cadmium	6.0E-04	3.3E+00	5.9E-01	1.9E+00	2.7E-01	1.5E+00	1.9E-01
Chromium	1.2E-03	1.2E+01	4.1E-02	4.9E-01	1.9E-01	2.7E+00	7.3E-02
Copper	4.8E-03	2.2E+01	1.2E-01	2.7E+00	5.7E-01	4.1E+00	1.4E-01
Lead	1.3E-03	7.7E+01	2.7E-01	2.0E+01	3.4E+00	1.6E+00	2.1E+00
Manganese	3.9E-01	5.6E+02	7.9E-02	4.4E+01	1.2E+01	1.8E+02	6.6E-02
Mercury	4.2E-05	2.5E-01	6.5E-01	1.6E-01	2.3E-02	4.5E-01	5.0E-02
Nickel	2.9E-03	8.5E+00	1.8E-02	1.5E-01	1.2E-01	6.7E+00	1.7E-02
Selenium	2.5E-03	7.6E-01	6.7E-01	5.1E-01	7.1E-02	2.9E-01	2.4E-01
Silver	7.0E-04	2.1E-01	1.4E-02	3.0E-03	2.9E-03	2.0E+00	1.4E-03
Vanadium	1.0E-02	2.0E+01	4.9E-03	9.6E-02	2.4E-01	9.9E-01	2.4E-01
Zinc	1.1E-02	5.5E+02	3.7E-01	2.0E+02	3.0E+01	6.6E+01	4.6E-01
4,4'-DDT	1.1E-05	2.4E-02	6.2E-02	1.5E-03	4.5E-04	2.3E-01	2.0E-03
beta-BHC	1.2E-06	4.0E-02	2.0E-03	7.8E-05	4.6E-04	4.0E+00	1.2E-04
gamma-Chlordane	8.3E-06	2.8E-02	1.6E-01	4.5E-03	8.6E-04	2.1E+00	4.0E-04
High Molecular Weight PAHs	6.4E-05	1.6E+00	3.4E-01	5.6E-01	8.7E-02	2.0E+00	4.3E-02

Mourning Dove consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Conservative Analysis
Brine Service Company Superfund Site

East Ditch (South Segment)
Sediment as Soil (Conservative HQs)
Red-winged Blackbird

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	9.10E-02	2.45E+02	1.6E-01	4.2E+02	7.50E+01	2.08E+01	3.6E+00
Cadmium	6.0E-04	3.3E+00	7.71E+00	2.56E+01	5.9E-01	1.9E+00	1.48E+00	1.47E+00	1.0E+00
Chromium	1.2E-03	1.2E+01	3.06E-01	3.64E+00	4.1E-02	4.9E-01	2.78E-01	2.66E+00	1.0E-01
Copper	4.8E-03	2.2E+01	5.15E-01	1.11E+01	1.2E-01	2.7E+00	9.45E-01	4.05E+00	2.3E-01
Lead	1.3E-03	7.7E+01	3.89E-02	3.00E+00	2.7E-01	2.0E+01	3.04E+00	1.63E+00	1.9E+00
Manganese	3.9E-01	5.6E+02	5.40E-02	3.02E+01	7.9E-02	4.4E+01	9.15E+00	1.79E+02	5.1E-02
Mercury	4.2E-05	2.5E-01	1.69E+00	4.23E-01	6.5E-01	1.6E-01	4.19E-02	4.50E-01	9.3E-02
Nickel	2.9E-03	8.5E+00	1.06E+00	9.03E+00	1.8E-02	1.5E-01	4.79E-01	6.71E+00	7.1E-02
Selenium	2.5E-03	7.6E-01	9.85E-01	7.46E-01	6.7E-01	5.1E-01	1.04E-01	2.90E-01	3.6E-01
Silver	7.0E-04	2.1E-01	2.05E+00	4.36E-01	1.4E-02	3.0E-03	2.19E-02	2.02E+00	1.1E-02
Vanadium	1.0E-02	2.0E+01	4.20E-02	8.32E-01	4.9E-03	9.6E-02	1.23E-01	9.88E-01	1.2E-01
Zinc	1.1E-02	5.5E+02	3.20E+00	1.74E+03	3.7E-01	2.0E+02	1.10E+02	6.61E+01	1.7E+00
4,4'-DDT	1.1E-05	2.4E-02	9.95E+00	2.39E-01	6.2E-02	1.5E-03	1.16E-02	2.27E-01	5.1E-02
beta-BHC	1.2E-06	4.0E-02	3.00E-01	1.20E-02	2.0E-03	7.8E-05	7.21E-04	4.00E+00	1.8E-04
gamma-Chlordane	8.3E-06	2.8E-02	2.87E+01	8.04E-01	1.6E-01	4.5E-03	3.88E-02	2.14E+00	1.8E-02
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.77E+00	2.90E+00	3.4E-01	5.6E-01	2.15E-01	2.00E+00	1.1E-01

Red-winged blackbird consumes 73% terrestrial plants and 27% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.73) + (FI x Soil Conc. X UFinverts x 0.27) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Conservative HQs)

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	9.10E-02	2.45E+02	1.6E-01	4.2E+02	5.5E+01	5.20E+01	1.1E+00
Cadmium	6.0E-04	3.3E+00	7.71E+00	2.56E+01	5.9E-01	1.9E+00	1.96E+00	7.70E-01	2.5E+00
Chromium	1.2E-03	1.2E+01	3.06E-01	3.64E+00	4.1E-02	4.9E-01	3.27E-01	2.40E+00	1.4E-01
Copper	4.8E-03	2.2E+01	5.15E-01	1.11E+01	1.2E-01	2.7E+00	1.04E+00	5.60E+00	1.9E-01
Lead	1.3E-03	7.7E+01	3.89E-02	3.00E+00	2.7E-01	2.0E+01	1.88E+00	4.70E+00	4.0E-01
Manganese	3.9E-01	5.6E+02	5.40E-02	3.02E+01	7.9E-02	4.4E+01	6.93E+00	5.15E+01	1.3E-01
Mercury	4.2E-05	2.5E-01	1.69E+00	4.23E-01	6.5E-01	1.6E-01	4.23E-02	3.80E-01	1.1E-01
Nickel	2.9E-03	8.5E+00	1.06E+00	9.03E+00	1.8E-02	1.5E-01	6.76E-01	1.70E+00	4.0E-01
Selenium	2.5E-03	7.6E-01	9.85E-01	7.46E-01	6.7E-01	5.1E-01	9.15E-02	1.43E-01	6.4E-01
Silver	7.0E-04	2.1E-01	2.05E+00	4.36E-01	1.4E-02	3.0E-03	3.18E-02	6.02E+00	5.3E-03
Vanadium	1.0E-02	2.0E+01	4.20E-02	8.32E-01	4.9E-03	9.6E-02	1.24E-01	3.43E+00	3.6E-02
Zinc	1.1E-02	5.5E+02	3.20E+00	1.74E+03	3.7E-01	2.0E+02	1.39E+02	7.54E+01	1.8E+00
4,4'-DDT	1.1E-05	2.4E-02	9.95E+00	2.39E-01	6.2E-02	1.5E-03	1.71E-02	1.47E-01	1.2E-01
beta-BHC	1.2E-06	4.0E-02	3.00E-01	1.20E-02	2.0E-03	7.8E-05	9.71E-04	4.00E+00	2.4E-04
gamma-Chlordane	8.3E-06	2.8E-02	2.87E+01	8.04E-01	1.6E-01	4.5E-03	5.74E-02	2.40E+00	2.4E-02
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.77E+00	2.90E+00	3.4E-01	5.6E-01	2.50E-01	6.15E-01	4.1E-01

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

$$\text{Dose} = (\text{WI} \times \text{Water Conc}) + (\text{FI} \times \text{Soil Conc.} \times \text{UFplants} \times 0.5) + (\text{FI} \times \text{Soil Conc.} \times \text{UFinverts} \times 0.5) + (\text{SI} \times \text{Soil Conc.})/\text{BW}$$

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

**East Ditch (South Segment)
Sediment as Soil (Conservative HQs)
Eastern Cottontail**

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	1.6E-01	4.2E+02	4.2E+01	5.2E+01	8.0E-01
Cadmium	6.0E-04	3.3E+00	5.9E-01	1.9E+00	1.5E-01	7.7E-01	1.9E-01
Chromium	1.2E-03	1.2E+01	4.1E-02	4.9E-01	9.3E-02	2.4E+00	3.9E-02
Copper	4.8E-03	2.2E+01	1.2E-01	2.7E+00	2.9E-01	5.6E+00	5.1E-02
Lead	1.3E-03	7.7E+01	2.7E-01	2.0E+01	1.8E+00	4.7E+00	3.7E-01
Manganese	3.9E-01	5.6E+02	7.9E-02	4.4E+01	5.8E+00	5.2E+01	1.1E-01
Mercury	4.2E-05	2.5E-01	6.5E-01	1.6E-01	1.2E-02	3.8E-01	3.2E-02
Nickel	2.9E-03	8.5E+00	1.8E-02	1.5E-01	5.4E-02	1.7E+00	3.2E-02
Selenium	2.5E-03	7.6E-01	6.7E-01	5.1E-01	3.8E-02	1.4E-01	2.7E-01
Silver	7.0E-04	2.1E-01	1.4E-02	3.0E-03	1.4E-03	6.0E+00	2.3E-04
Vanadium	1.0E-02	2.0E+01	4.9E-03	9.6E-02	1.1E-01	3.4E+00	3.2E-02
Zinc	1.1E-02	5.5E+02	3.7E-01	2.0E+02	1.6E+01	7.5E+01	2.1E-01
4,4'-DDT	1.1E-05	2.4E-02	6.2E-02	1.5E-03	2.2E-04	1.5E-01	1.5E-03
beta-BHC	1.2E-06	4.0E-02	2.0E-03	7.8E-05	2.1E-04	4.0E+00	5.2E-05
gamma-Chlordane	8.3E-06	2.8E-02	1.6E-01	4.5E-03	4.4E-04	2.4E+00	1.8E-04
High Molecular Weight PAHs	6.4E-05	1.6E+00	3.4E-01	5.6E-01	4.6E-02	6.2E-01	7.4E-02
Eastern Cottontail consumes 100% terrestrial plants.							
Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW							

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Conservative HQs)

Coyote

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	5.7E-02	1.5E+02	9.8E+00	5.2E+01	1.9E-01
Cadmium	6.0E-04	3.3E+00	5.2E-01	1.7E+00	7.8E-02	7.7E-01	1.0E-01
Chromium	1.2E-03	1.2E+01	8.5E-02	1.0E+00	5.8E-02	2.4E+00	2.4E-02
Copper	4.8E-03	2.2E+01	2.4E-01	5.2E+00	2.5E-01	5.6E+00	4.4E-02
Lead	1.3E-03	7.7E+01	7.4E-02	5.7E+00	3.4E-01	4.7E+00	7.1E-02
Manganese	3.9E-01	5.6E+02	2.1E-02	1.1E+01	1.2E+00	5.2E+01	2.3E-02
Mercury	4.2E-05	2.5E-01	5.4E-02	1.4E-02	8.8E-04	3.8E-01	2.3E-03
Nickel	2.9E-03	8.5E+00	1.1E-01	9.7E-01	5.2E-02	1.7E+00	3.1E-02
Selenium	2.5E-03	7.6E-01	5.2E-01	3.9E-01	1.8E-02	1.4E-01	1.3E-01
Silver	7.0E-04	2.1E-01	4.0E-03	8.5E-04	3.5E-04	6.0E+00	5.7E-05
Vanadium	1.0E-02	2.0E+01	1.2E-02	2.4E-01	3.5E-02	3.4E+00	1.0E-02
Zinc	1.1E-02	5.5E+02	5.7E-01	3.1E+02	1.4E+01	7.5E+01	1.9E-01
4,4'-DDT	1.1E-05	2.4E-02	2.0E+00	4.9E-02	2.1E-03	1.5E-01	1.4E-02
beta-BHC	1.2E-06	4.0E-02	1.5E+00	5.8E-02	2.6E-03	4.0E+00	6.4E-04
gamma-Chlordane	8.3E-06	2.8E-02	1.5E+00	4.1E-02	1.8E-03	2.4E+00	7.4E-04
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.0E-05	1.6E-05	2.0E-03	6.2E-01	3.2E-03

Coyote consumes 100% terrestrial mammals.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Conservative HQs)

Least Shrew

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	9.1E-02	2.4E+02	6.1E+01	5.2E+01	1.2E+00
Cadmium	6.0E-04	3.3E+00	7.7E+00	2.6E+01	3.6E+00	7.7E-01	4.7E+00
Chromium	1.2E-03	1.2E+01	3.1E-01	3.6E+00	6.3E-01	2.4E+00	2.6E-01
Copper	4.8E-03	2.2E+01	5.2E-01	1.1E+01	1.8E+00	5.6E+00	3.2E-01
Lead	1.3E-03	7.7E+01	3.9E-02	3.0E+00	1.2E+00	4.7E+00	2.5E-01
Manganese	3.9E-01	5.6E+02	5.4E-02	3.0E+01	9.8E+00	5.2E+01	1.9E-01
Mercury	4.2E-05	2.5E-01	1.7E+00	4.2E-01	6.2E-02	3.8E-01	1.6E-01
Nickel	2.9E-03	8.5E+00	1.1E+00	9.0E+00	1.4E+00	1.7E+00	8.0E-01
Selenium	2.5E-03	7.6E-01	9.9E-01	7.5E-01	1.1E-01	1.4E-01	7.9E-01
Silver	7.0E-04	2.1E-01	2.0E+00	4.4E-01	6.4E-02	6.0E+00	1.1E-02
Vanadium	1.0E-02	2.0E+01	4.2E-02	8.3E-01	3.1E-01	3.4E+00	9.2E-02
Zinc	1.1E-02	5.5E+02	3.2E+00	1.7E+03	2.5E+02	7.5E+01	3.3E+00
4,4'-DDT	1.1E-05	2.4E-02	1.0E+01	2.4E-01	3.4E-02	1.5E-01	2.3E-01
beta-BHC	1.2E-06	4.0E-02	3.0E-01	1.2E-02	2.1E-03	4.0E+00	5.2E-04
gamma-Chlordane	8.3E-06	2.8E-02	2.9E+01	8.0E-01	1.1E-01	2.4E+00	4.7E-02
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.8E+00	2.9E+00	4.3E-01	6.2E-01	6.9E-01

Least Shrew consumes 100% terrestrial plants

Dose = (WI x Water Conc) + (FI x Soil Conc. X UF_{Invertebrates} x 1) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

**East Ditch (South Segment)
Sediment as Soil (Conservative HQs)
Texas Pocket Gopher**

COC	Maximum Surface Water Conc (mg/L)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	1.6E-01	4.2E+02	5.0E+01	5.2E+01	9.6E-01
Cadmium	6.0E-04	3.3E+00	5.9E-01	1.9E+00	1.8E-01	7.7E-01	2.3E-01
Chromium	1.2E-03	1.2E+01	4.1E-02	4.9E-01	1.1E-01	2.4E+00	4.7E-02
Copper	4.8E-03	2.2E+01	1.2E-01	2.7E+00	3.5E-01	5.6E+00	6.2E-02
Lead	1.3E-03	7.7E+01	2.7E-01	2.0E+01	2.1E+00	4.7E+00	4.5E-01
Manganese	3.9E-01	5.6E+02	7.9E-02	4.4E+01	7.0E+00	5.2E+01	1.4E-01
Mercury	4.2E-05	2.5E-01	6.5E-01	1.6E-01	1.5E-02	3.8E-01	3.8E-02
Nickel	2.9E-03	8.5E+00	1.8E-02	1.5E-01	6.5E-02	1.7E+00	3.8E-02
Selenium	2.5E-03	7.6E-01	6.7E-01	5.1E-01	4.6E-02	1.4E-01	3.2E-01
Silver	7.0E-04	2.1E-01	1.4E-02	3.0E-03	1.6E-03	6.0E+00	2.7E-04
Vanadium	1.0E-02	2.0E+01	4.9E-03	9.6E-02	1.3E-01	3.4E+00	3.8E-02
Zinc	1.1E-02	5.5E+02	3.7E-01	2.0E+02	1.9E+01	7.5E+01	2.6E-01
4,4'-DDT	1.1E-05	2.4E-02	6.2E-02	1.5E-03	2.7E-04	1.5E-01	1.8E-03
beta-BHC	1.2E-06	4.0E-02	2.0E-03	7.8E-05	2.5E-04	4.0E+00	6.3E-05
gamma-Chlordane	8.3E-06	2.8E-02	1.6E-01	4.5E-03	5.3E-04	2.4E+00	2.2E-04
High Molecular Weight PAHs	6.4E-05	1.6E+00	3.4E-01	5.6E-01	5.5E-02	6.2E-01	8.9E-02

Texas pocket gopher consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Texas pocket gopher is exposed to the 1-2 foot soil zone only.

East Ditch (South Segment) Sediment as Soil - Conservative Analysis
Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Conservative HQs) Nine-banded Armadillo										
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	3.0E-01	2.7E+03	2.7E+03	9.10E-02	2.45E+02	1.6E-01	4.2E+02	3.8E+01	5.20E+01	7.27E-01
Cadmium	6.0E-04	3.3E+00	3.3E+00	7.71E+00	2.56E+01	5.9E-01	1.9E+00	1.2E+00	7.70E-01	1.62E+00
Chromium	1.2E-03	1.2E+01	1.2E+01	3.06E-01	3.64E+00	4.1E-02	4.9E-01	2.8E-01	2.40E+00	1.17E-01
Copper	4.8E-03	2.2E+01	2.2E+01	5.15E-01	1.11E+01	1.2E-01	2.7E+00	7.3E-01	5.60E+00	1.30E-01
Lead	1.3E-03	7.7E+01	7.7E+01	3.89E-02	3.00E+00	2.7E-01	2.0E+01	9.4E-01	4.70E+00	1.99E-01
Manganese	3.9E-01	5.6E+02	5.6E+02	5.40E-02	3.02E+01	7.9E-02	4.4E+01	6.7E+00	5.15E+01	1.30E-01
Mercury	4.2E-05	2.5E-01	2.5E-01	1.69E+00	4.23E-01	6.5E-01	1.6E-01	2.3E-02	3.80E-01	6.08E-02
Nickel	2.9E-03	8.5E+00	8.5E+00	1.06E+00	9.03E+00	1.8E-02	1.5E-01	5.0E-01	1.70E+00	2.96E-01
Selenium	2.5E-03	7.6E-01	7.6E-01	9.85E-01	7.46E-01	6.7E-01	5.1E-01	4.5E-02	1.43E-01	3.14E-01
Silver	7.0E-04	2.1E-01	2.1E-01	2.05E+00	4.36E-01	1.4E-02	3.0E-03	2.3E-02	6.02E+00	3.75E-03
Vanadium	1.0E-02	2.0E+01	2.0E+01	4.20E-02	8.32E-01	4.9E-03	9.6E-02	2.2E-01	3.43E+00	6.34E-02
Zinc	1.1E-02	5.5E+02	5.5E+02	3.20E+00	1.74E+03	3.7E-01	2.0E+02	8.8E+01	7.54E+01	1.17E+00
4,4'-DDT	1.1E-05	2.4E-02	2.4E-02	9.95E+00	2.39E-01	6.2E-02	1.5E-03	1.2E-02	1.47E-01	7.83E-02
beta-BHC	1.2E-06	4.0E-02	4.0E-02	3.00E-01	1.20E-02	2.0E-03	7.8E-05	9.2E-04	4.00E+00	2.31E-04
gamma-Chlordane	8.3E-06	2.8E-02	2.8E-02	2.87E+01	8.04E-01	1.6E-01	4.5E-03	3.8E-02	2.40E+00	1.59E-02
High Molecular Weight PAHs	6.4E-05	1.6E+00	1.6E+00	1.77E+00	2.90E+00	3.4E-01	5.6E-01	1.5E-01	6.15E-01	2.51E-01

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Since heptachlor and 2,4-dimethylphenol were not detected in surface soil the 0-2 foot concentration was used to estimate food concentrations.

East Ditch (South Segment) Sediment as Soil - Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Conservative HQs)

Texas Indigo Snake

COC	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	2.7E+03	5.7E-02	1.5E+02	3.2E+01	2.1E+00	1.5E+01
Cadmium	3.3E+00	5.2E-01	1.7E+00	2.6E-01	1.5E-01	1.7E+00
Chromium	1.2E+01	8.5E-02	1.0E+00	1.9E-01	2.7E-01	7.1E-01
Copper	2.2E+01	2.4E-01	5.2E+00	8.1E-01	4.1E-01	2.0E+00
Lead	7.7E+01	7.4E-02	5.7E+00	1.1E+00	2.0E-01	5.5E+00
Manganese	5.6E+02	2.1E-02	1.1E+01	3.8E+00	1.8E+01	2.1E-01
Mercury	2.5E-01	5.4E-02	1.4E-02	2.9E-03	4.5E-02	6.4E-02
Nickel	8.5E+00	1.1E-01	9.7E-01	1.7E-01	6.7E-01	2.5E-01
Selenium	7.6E-01	5.2E-01	3.9E-01	5.8E-02	2.9E-02	2.0E+00
Silver	2.1E-01	4.0E-03	8.5E-04	9.5E-04	2.0E-01	4.7E-03
Vanadium	2.0E+01	1.2E-02	2.4E-01	1.1E-01	9.9E-02	1.1E+00
Zinc	5.5E+02	5.7E-01	3.1E+02	4.6E+01	6.6E+00	6.9E+00
4,4'-DDT	2.4E-02	2.0E+00	4.9E-02	6.9E-03	2.3E-02	3.1E-01
beta-BHC	4.0E-02	1.5E+00	5.8E-02	8.3E-03	4.0E-01	2.1E-02
gamma-Chlordane	2.8E-02	1.5E+00	4.1E-02	5.8E-03	2.1E-01	2.7E-02
High Molecular Weight PAHs	1.6E+00	1.0E-05	1.6E-05	6.4E-03	2.0E-01	3.2E-02

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

SLERA NOAEL HQ Summary for Terrestrial Species at East Ditch Sediment as Soils Conservative Analysis

East Ditch Sediment as Soil												
SLERA												
East Ditch (South Segment)												
Sediment as Soil (Conservative HQs)												
COPC	Red-Tailed Hawk	American Robin	Mourning Dove	Red-Winged Blackbird	White Footed Mouse	Eastern Cottontail	Coyote	Least Shrew	Texas Pocket Gopher	Nine-Banded Armadillo	Texas Indigo Snake	
	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ	NOAEL-HQ
Barium	6.3E-01	3.2E+00	3.9E+00	3.6E+00	1.1E+00	8.0E-01	1.9E-01	1.2E+00	9.6E-01	7.3E-01	1.5E+01	
Cadmium	7.1E-02	1.3E+00	1.9E-01	1.0E+00	2.5E+00	1.9E-01	1.0E-01	4.7E+00	2.3E-01	1.6E+00	1.7E+00	
Chromium	2.9E-02	1.4E-01	7.3E-02	1.0E-01	1.4E-01	3.9E-02	2.4E-02	2.6E-01	4.7E-02	1.2E-01	7.1E-01	
Copper	8.2E-02	2.8E-01	1.4E-01	2.3E-01	1.9E-01	5.1E-02	4.4E-02	3.2E-01	6.2E-02	1.3E-01	2.0E+00	
Lead	2.8E-01	1.4E+00	2.1E+00	1.9E+00	4.0E-01	3.7E-01	7.1E-02	2.5E-01	4.5E-01	2.0E-01	5.5E+00	
Manganese	9.0E-03	5.3E-02	6.6E-02	5.1E-02	1.3E-01	1.1E-01	2.3E-02	1.9E-01	1.4E-01	1.3E-01	2.1E-01	
Mercury	2.7E-03	9.7E-02	5.0E-02	9.3E-02	1.1E-01	3.2E-02	2.3E-03	1.6E-01	3.8E-02	6.1E-02	6.4E-02	
Nickel	1.0E-02	1.1E-01	1.7E-02	7.1E-02	4.0E-01	3.2E-02	3.1E-02	8.0E-01	3.8E-02	3.0E-01	2.5E-01	
Selenium	8.3E-02	3.3E-01	2.4E-01	3.6E-01	6.4E-01	2.7E-01	1.3E-01	7.9E-01	3.2E-01	3.1E-01	2.0E+00	
Silver	2.2E-04	1.6E-02	1.4E-03	1.1E-02	5.3E-03	2.3E-04	5.7E-05	1.1E-02	2.7E-04	3.7E-03	4.7E-03	
Vanadium	4.8E-02	2.2E-01	2.4E-01	1.2E-01	3.6E-02	3.2E-02	1.0E-02	9.2E-02	3.8E-02	6.3E-02	1.1E+00	
Zinc	2.8E-01	2.2E+00	4.6E-01	1.7E+00	1.8E+00	2.1E-01	1.9E-01	3.3E+00	2.6E-01	1.2E+00	6.9E+00	
4,4'-DDT	1.3E-02	7.6E-02	2.0E-03	5.1E-02	1.2E-01	1.5E-03	1.4E-02	2.3E-01	1.8E-03	7.8E-02	3.1E-01	
beta-BHC	8.5E-04	2.9E-04	1.2E-04	1.8E-04	2.4E-04	5.2E-05	6.4E-04	5.2E-04	6.3E-05	2.3E-04	2.1E-02	
gamma-Chlordane	1.1E-03	2.7E-02	4.0E-04	1.8E-02	2.4E-02	1.8E-04	7.4E-04	4.7E-02	2.2E-04	1.6E-02	2.7E-02	
High Molecular Weight PAHs	1.4E-03	1.3E-01	4.3E-02	1.1E-01	4.1E-01	7.4E-02	3.2E-03	6.9E-01	8.9E-02	2.5E-01	3.2E-02	

East Ditch Sediment (South)
SLERA HQ Calculations
Conservative Analysis
EPC = Maximum Detection
AUF = 1
NOAEL-based HQs

East Ditch Sediment South
Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	EMF	Body Weight (kg)		Food Ingestion Rate (kg/day DW)		Water Ingestion Rate (L/day)	Sediment Ingestion (% of diet)		Sediment Ingestion rate (kg/day)
Birds											
Snowy Egret	<i>Egretta thula</i>	Invertevore/Carnivore	1	0.371	a	0.03050	b	0.03	b	7.3	d 0.0022
Mammals											
Raccoon	<i>Procyon lotor</i>	Omnivore	1	5.63	e	0.284	c	0.468	c	9.4	d 0.0267
Notes:											
a To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).											
b Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.											
Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.											
c Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.											
Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.											
d Estimates of Soil Ingestion by Wildlife (Beyer, 1994). Soil/Sediment ingestion taken directly from Beyer (1994). Least sandpiper used as surrogate. Egrets do not forage as deep in sediment as sandpipers.											
e Wildlife Exposure Factors Handbook (USEPA, 1993). Geometric mean of body weights for both sexes is used for raccoon.											

East Ditch Sediment (South)
Brine Service Company Superfund Site

Common Name	Percent of Components in Receptor Diet		Benthic Invertebrates	Fish	Amphibians
	Aquatic Vascular	Aquatic Insects			
	Plants				
Birds					
Snowy Egret		5	20	70	5
Mammals					
Raccoon	5	5	55	25	10

East Ditch Sediment (South) - Conservative Analysis

Brine Service Company Superfund Site

COCs	CAS No.	Exposure Point Concentrations	
		Max Surface Water	Max Sediment
		mg/L	mg/kg
Antimony	7440-36-0	0.00106	0.369
Barium	7440-39-3	0.301	2690
Beryllium	7440-41-7	0.000507	0.621
Cadmium	7440-43-9	0.0006	3.32
Copper	7440-50-8	0.00479	21.5
Lead	7439-92-1	0.00133	77
Manganese	7439-96-5	0.391	559
Nickel	7440-02-0	0.00293	8.53
Selenium	7782-49-2	0.0025	0.757
Thallium	7440-28-0	0.0008	0.288
Vanadium	7440-62-2	0.0007	19.8
Zinc	7440-66-6	0.0108	545
Mercury	7439-97-6	0.000042	0.25
4,4'-DDT	50-29-3	0.000011	0.024
beta-BHC	319-85-7	0.0000012	0.04
gamma-Chlordane	5103-74-2	0.0000083	0.028
Bis(2-ethylhexyl)phthalate	117-81-7	0.0026	0.57
High Molecular Weight PAHs	HPAH	0.000064	1.636
Low Molecular Weight PAHs	LPAH	0.000064	0.2365
Total PAHs	TPAH	0.000064	1.87
Cyanide	57-12-5	0.005	0.99

East Ditch Sediment (South) - Conservative Analysis

Brine Service Company Superfund Site

Southern Portion of East Ditch											
Snowy Egret	COC	CAS No.	Max Surface Water Conc (mg/L)	Max Sediment Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Antimony		7440-36-0	1.1E-03	3.7E-01	3.0E-01	1.1E-01	1.7E-01	6.3E-02	8.3E-03	No TRV	No TRV
Barium		7440-39-3	3.0E-01	2.7E+03	2.8E+00	7.5E+03	2.8E-01	7.5E+02	1.9E+02	2.1E+01	9.1E+00
Beryllium		7440-41-7	5.1E-04	6.2E-01	1.3E-01	7.8E-02	1.3E-01	7.8E-02	1.0E-02	No TRV	No TRV
Cadmium		7440-43-9	6.0E-04	3.3E+00	4.6E-01	1.5E+00	4.2E-01	1.4E+00	1.4E-01	1.5E+00	9.3E-02
Copper		7440-50-8	4.8E-03	2.2E+01	6.6E-01	1.4E+01	3.6E-01	7.8E+00	8.7E-01	4.1E+00	2.2E-01
Lead		7439-92-1	1.3E-03	7.7E+01	8.0E-02	6.2E+00	1.9E-01	1.4E+01	1.5E+00	1.6E+00	9.3E-01
Manganese		7439-96-5	3.9E-01	5.6E+02	1.9E-01	1.1E+02	3.0E-02	1.7E+01	6.2E+00	1.8E+02	3.5E-02
Nickel		7440-02-0	2.9E-03	8.5E+00	1.3E-01	1.1E+00	1.7E-01	1.4E+00	1.7E-01	6.7E+00	2.5E-02
Selenium		7782-49-2	2.5E-03	7.6E-01	3.7E+00	2.8E+00	4.8E+00	3.6E+00	2.9E-01	2.9E-01	1.0E+00
Thallium		7440-28-0	8.0E-04	2.9E-01	3.0E-01	8.6E-02	1.7E-01	4.9E-02	6.5E-03	No TRV	No TRV
Vanadium		7440-62-2	7.0E-04	2.0E+01	3.1E-01	6.1E+00	3.3E-02	6.5E-01	2.6E-01	9.9E-01	2.7E-01
Zinc		7440-66-6	1.1E-02	5.5E+02	8.4E-01	4.6E+02	1.4E-01	7.5E+01	1.6E+01	6.6E+01	2.4E-01
Mercury		7439-97-6	4.2E-05	2.5E-01	2.8E+00	7.1E-01	2.6E+00	6.6E-01	5.6E-02	4.5E-01	1.2E-01
4,4'-DDT		50-29-3	1.1E-05	2.4E-02	3.6E+01	8.5E-01	9.2E+01	2.2E+00	1.6E-01	2.3E-01	7.0E-01
beta-BHC		319-85-7	1.2E-06	4.0E-02	1.6E+01	6.4E-01	2.0E+01	7.8E-01	6.2E-02	4.0E+00	1.6E-02
gamma-Chlordane		5103-74-2	8.3E-06	2.8E-02	8.1E+00	2.3E-01	2.3E+01	6.4E-01	4.6E-02	2.1E+00	2.1E-02
Bis(2-ethylhexyl)phthalate		117-81-7	2.6E-03	5.7E-01	7.4E+00	4.2E+00	1.5E+01	8.7E+00	6.5E-01	3.5E-01	1.9E+00
High Molecular Weight PAHs		HPAH	6.4E-05	1.6E+00	2.4E+00	3.9E+00	6.4E-02	1.1E-01	8.0E-02	2.0E+00	4.0E-02
Low Molecular Weight PAHs		LPAH	6.4E-05	2.4E-01	2.3E+00	5.3E-01	4.3E-01	1.0E-01	1.7E-02	1.7E+03	1.0E-05
Total PAHs		TPAH	6.4E-05	1.9E+00	2.3E+00	4.3E+00	2.0E-01	3.7E-01	1.1E-01	2.0E+00	5.3E-02
Cyanide		57-12-5	5.0E-03	9.9E-01	3.0E-01	3.0E-01	1.7E-01	1.7E-01	2.2E-02	6.5E-01	3.4E-02

$$\text{Dose} = (\text{WI} \times \text{Water Conc}) + (\text{FI} \times \text{Sed Conc.} \times \text{UFbenthics} \times 0.20) + (\text{FI} \times \text{Sed Conc.} \times \text{Uffish} \times 0.80) + (\text{SI} \times \text{Sed Conc.})/\text{BW}$$

Note that the workplan states that diet consists of 5% of aquatic insects, 70% fish and 5% amphibians. These portions of diet are represented by sed conc. X fish UF.

Fish ingestion is considered to be 80% and benthic invertebrate proportion is assumed to be 20%.

Snowy egret is surrogate species for special status species and therefore only NOAEL evaluation is conducted.

East Ditch Sediment (South) - Conservative Analysis
Brine Service Company Superfund Site

Southern Portion of East Ditch																	NOAEL	NOAEL
Raccoon																	Toxicity Reference	Hazard Quotient
COC	CAS No.	Max Surface Water Conc (mg/L)	Max Sediment Conc (mg/kg)	Aquatic Plant UF (unitless)	Aquatic Plant Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Aquatic Insect UF (unitless)	Aquatic Insect Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Amphibian UF (unitless)	Amphibian Conc (mg/kg)	Total Daily Dose (mg/kg BW-day)	Value (mg/kg BW-day)			
Antimony	7440-36-0	1.1E-03	3.7E-01	2.5E-02	9.2E-03	3.0E-01	1.1E-01	6.3E-02	1.7E-01	6.3E-02	3.0E-01	1.1E-01	6.3E-03	5.6E+00	1.1E-03			
Barium	7440-39-3	3.0E-01	2.69E+03	1.6E-01	4.2E+02	2.8E+00	7.5E+03	2.8E-01	7.5E+02	2.8E-01	7.5E+02	2.8E+00	7.5E+03	2.7E+02	5.2E+01	5.2E+00		
Beryllium	7440-41-7	5.1E-04	6.21E-01	2.1E-01	1.3E-01	1.3E-01	7.8E-02	1.3E-01	7.8E-02	1.3E-01	7.8E-02	1.3E-01	7.8E-02	6.8E-03	5.3E-01	1.3E-02		
Cadmium	7440-43-9	6.0E-04	3.32E+00	5.9E-01	1.9E+00	4.6E-01	1.5E+00	4.2E-01	1.4E+00	4.2E-01	1.4E+00	4.6E-01	1.5E+00	8.8E-02	7.7E-01	1.1E-01		
Copper	7440-50-8	4.8E-03	2.15E+01	1.2E-01	2.7E+00	6.6E-01	1.4E+01	3.6E-01	7.8E+00	3.6E-01	7.8E+00	6.6E-01	1.4E+01	6.7E-01	5.6E+00	1.2E-01		
Lead	7439-92-1	1.3E-03	7.70E+01	2.7E-01	2.0E+01	8.0E-02	6.2E+00	1.9E-01	1.4E+01	1.9E-01	1.4E+01	8.0E-02	6.2E+00	8.0E-01	4.7E+00	1.7E-01		
Manganese	7439-96-5	3.9E-01	5.59E+02	7.9E-02	4.4E+01	1.9E-01	1.1E+02	3.0E-02	1.7E+01	3.0E-02	1.7E+01	1.9E-01	1.1E+02	6.5E+00	5.2E+01	1.3E-01		
Nickel	7440-02-0	2.9E-03	8.53E+00	1.8E-02	1.5E-01	1.3E-01	1.1E+00	1.7E-01	1.4E+00	1.7E-01	1.4E+00	1.3E-01	1.1E+00	9.7E-02	1.7E+00	5.7E-02		
Selenium	7782-49-2	2.5E-03	7.57E-01	6.7E-01	5.1E-01	3.7E+00	2.8E+00	4.8E+00	3.6E+00	4.8E+00	3.6E+00	3.7E+00	2.8E+00	1.4E-01	1.4E-01	9.9E-01		
Thallium	7740-28-0	8.0E-04	2.88E-01	1.3E-01	3.7E-02	3.0E-01	8.6E-02	1.7E-01	4.9E-02	1.7E-01	4.9E-02	3.0E-01	8.6E-02	5.0E-03	7.4E-03	6.7E-01		
Vanadium	7440-62-2	7.0E-04	1.98E+01	4.9E-03	9.6E-02	3.1E-01	6.1E+00	3.3E-02	6.5E-01	3.3E-02	6.5E-01	3.1E-01	6.1E+00	3.0E-01	3.4E+00	8.9E-02		
Zinc	7440-66-6	1.1E-02	5.45E+02	3.7E-01	2.0E+02	8.4E-01	4.6E+02	1.4E-01	7.5E+01	1.4E-01	7.5E+01	8.4E-01	4.6E+02	1.9E+01	7.5E+01	2.5E-01		
Mercury	7439-97-6	4.2E-05	2.50E-01	6.5E-01	1.6E-01	2.8E+00	7.1E-01	2.6E+00	6.6E-01	2.6E+00	6.6E-01	2.8E+00	7.1E-01	3.3E-02	3.8E-01	8.7E-02		
4,4'-DDT	50-29-3	1.1E-05	2.40E-02	6.2E-02	1.5E-03	3.6E+01	8.5E-01	9.2E+01	2.2E+00	9.2E+01	2.2E+00	3.6E+01	8.5E-01	5.6E-02	1.5E-01	3.8E-01		
beta-BHC	319-85-7	1.2E-06	4.00E-02	2.0E-03	7.8E-05	1.6E+01	6.4E-01	2.0E+01	7.8E-01	2.0E+01	7.8E-01	1.6E+01	6.4E-01	3.1E-02	4.0E+00	7.8E-03		
gamma-Chlordane	5103-74-2	8.3E-06	2.80E-02	1.6E-01	4.5E-03	8.1E+00	2.3E-01	2.3E+01	6.4E-01	2.3E+01	6.4E-01	8.1E+00	2.3E-01	1.6E-02	2.4E+00	6.5E-03		
Bis(2-ethylhexyl)phthalate	117-81-7	2.6E-03	5.70E-01	7.0E-02	4.0E-02	7.4E+00	4.2E+00	1.5E+01	8.7E+00	1.5E+01	8.7E+00	7.4E+00	4.2E+00	2.5E-01	4.4E+01	5.7E-03		
High Molecular Weight PAHs	HPAH	6.4E-05	1.64E+00	3.4E-01	5.6E-01	2.4E+00	3.9E+00	6.4E-02	1.1E-01	6.4E-02	1.1E-01	2.4E+00	3.9E+00	1.4E-01	6.2E-01	2.2E-01		
Low Molecular Weight PAHs	LPAH	6.4E-05	2.37E-01	4.6E+00	1.1E+00	2.3E+00	5.3E-01	4.3E-01	1.0E-01	4.3E-01	1.0E-01	2.3E+00	5.3E-01	2.3E-02	6.6E+01	3.4E-04		
Total PAHs	TPAH	6.4E-05	1.87E+00	2.2E+00	4.2E+00	2.3E+00	4.3E+00	2.0E-01	3.7E-01	2.0E-01	3.7E-01	2.3E+00	4.3E+00	1.7E-01	6.2E-01	2.7E-01		
Cyanide	57-12-5	5.0E-03	9.90E-01	1.3E-01	1.3E-01	3.0E-01	3.0E-01	1.7E-01	1.7E-01	1.7E-01	1.7E-01	3.0E-01	3.0E-01	1.7E-02	6.9E+01	2.5E-04		

Dose = (WI x Water Conc) + (FI x Sed Conc. X UFbenthics x 0.55) + (FI x Sed Conc. X Uffish x 0.25) + (FI x Sed Conc. X UF Aq Plant x 0.05) +(FI x Sed Conc. X Ufamphib x 0.1) + (FI x Sed Conc. X UF insect x 0.05)+(SI x Sed Conc.)/BW

East Ditch Marine (North Segment)
SLERA HQ Calculations
Conservative Analysis
EPC = Maximum Detection
AUF = 1
NOAEL-based HQs

East Ditch Marine (North Segment)

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors												
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	EMF	Body Weight (kg)		Food Ingestion Rate (kg/day DW)		Water Ingestion Rate (L/day)	Sediment Ingestion (% of diet)		Sediment Ingestion rate (kg/day)	
Birds												
Snowy Egret	<i>Egretta thula</i>	Invertevore/Carnivore	1	0.371	a	0.03050	b	0.03	b	7.3	d	0.0022
Mammals												
Raccoon	<i>Procyon lotor</i>	Omnivore	1	5.63	e	0.284	c	0.468	c	9.4	d	0.0267

Notes:

a To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).

b Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.

Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.

c Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.

Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.

d Estimates of Soil Ingestion by Wildlife (Beyer, 1994). Soil/Sediment ingestion taken directly from Beyer (1994). Least sandpiper used as surrogate. Egrets do not forage as deep in sediment as sandpipers.

e Wildlife Exposure Factors Handbook (USEPA, 1993). Geometric mean of body weights for both sexes is used for raccoon.

East Ditch Marine (North Segment)

Brine Service Company Superfund Site

Common Name	Percent of Components in Receptor Diet		Benthic Invertebrates	Fish	Amphibians
	Aquatic Vascular	Aquatic			
	Plants	Insects			
Birds					
Snowy Egret		5	20	70	5
Mammals					
Raccoon	5	5	55	25	10

East Ditch Marine (North Segment) - Conservative Analysis

Brine Service Company Superfund Site

Location:	Northern Portion of East Ditch		
		Exposure Point Concentrations	
		Max Surface Water	Max Sediment
COCs	CAS No.	mg/L	mg/kg
alpha-Chlordane	5103-71-9	7.50E-06	0.011
Arsenic	7440-38-2	1.56E-02	37.800
Barium	7440-39-3	6.39E-01	4730.000
Bis(2-ethylhexyl)phthalate	117-81-7	1.10E-03	1.600
Butyl benzyl phthalate	85-68-7	5.00E-05	0.013
Cadmium	7440-43-9	8.00E-04	3.760
Carbazole	86-74-8	5.00E-05	0.770
Cobalt	7440-48-4	6.62E-03	14.500
Copper	7440-50-8	3.44E-03	91.500
Cyanide	57-12-5	4.00E-03	3.030
Endosulfan sulfate	1031-07-8	6.10E-06	0.023
Heptachlor	76-44-8	1.40E-05	0.023
High Molecular Weight PAHs	HPAH	4.97E-04	40.100
Lead	7439-92-1	2.38E-03	225.000
Low Molecular Weight PAHs	LPAH	4.97E-04	5.605
Manganese	7439-96-5	2.70E+00	2590.000
Mercury	7439-97-6	7.40E-05	0.533
Nickel	7440-02-0	1.22E-02	9.750
Selenium	7782-49-2	4.76E-03	1.390
Total PAHs	TPAH	4.97E-04	60.940
Zinc	7440-66-6	5.42E-02	408.000

East Ditch Marine (North Segment) - Conservative Analysis

Brine Service Company Superfund Site

Northern Portion of East Ditch											
COC	CAS No.	Max Surface Water Conc (mg/L)	Max Sediment Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	
alpha-Chlordane	5103-71-9	7.5E-06	1.1E-02	8.1E+00	8.9E-02	2.3E+01	2.5E-01	1.8E-02	2.1E+00	8.4E-03	
Arsenic	7440-38-2	1.6E-02	3.8E+01	1.3E-01	4.8E+00	2.3E-01	8.5E+00	8.7E-01	2.2E+00	3.9E-01	
Barium	7440-39-3	6.4E-01	4.7E+03	2.8E+00	1.3E+04	2.8E-01	1.3E+03	3.3E+02	2.1E+01	1.6E+01	
Bis(2-ethylhexyl)phthalate	117-81-7	1.1E-03	1.6E+00	7.4E+00	1.2E+01	1.5E+01	2.4E+01	1.8E+00	3.5E-01	5.2E+00	
Butylbenzylphthalate	85-68-7	5.0E-05	1.3E-02	6.0E+00	7.8E-02	1.0E-01	1.3E-03	1.5E-03	3.5E-01	4.2E-03	
Cadmium	7440-43-9	8.0E-04	3.8E+00	4.6E-01	1.7E+00	4.2E-01	1.6E+00	1.5E-01	1.5E+00	1.1E-01	
Carbazole	86-74-8	5.0E-05	7.7E-01	3.3E+00	2.5E+00	1.0E+00	7.9E-01	9.8E-02	1.7E+03	5.9E-05	
Cobalt	7440-48-4	6.6E-03	1.5E+01	3.0E-01	4.4E+00	1.7E-01	2.5E+00	3.2E-01	7.6E+00	4.2E-02	
Copper	7440-50-8	3.4E-03	9.2E+01	6.6E-01	6.0E+01	3.6E-01	3.3E+01	3.7E+00	4.1E+00	9.2E-01	
Cyanide	57-12-5	4.0E-03	3.0E+00	3.0E-01	9.1E-01	1.7E-01	5.2E-01	6.8E-02	6.5E-01	1.0E-01	
Endosulfan sulfate	1031-07-8	6.1E-06	2.3E-02	3.2E+01	7.4E-01	3.0E+04	6.9E+02	4.5E+01	6.5E-02	7.0E+02	
Heptachlor	76-44-8	1.4E-05	2.3E-02	6.9E+01	1.6E+00	7.5E+01	1.7E+00	1.4E-01	1.7E+00	8.2E-02	
High Molecular Weight PAHs	HPAH	5.0E-04	4.0E+01	2.4E+00	9.5E+01	6.4E-02	2.6E+00	2.0E+00	2.0E+00	9.8E-01	
Lead	7439-92-1	2.4E-03	2.3E+02	8.0E-02	1.8E+01	1.9E-01	4.2E+01	4.4E+00	1.6E+00	2.7E+00	
Low Molecular Weight PAHs	LPAH	5.0E-04	5.6E+00	2.3E+00	1.3E+01	4.3E-01	2.4E+00	4.0E-01	1.7E+03	2.4E-04	
Manganese	7439-96-5	2.7E+00	2.6E+03	1.9E-01	4.9E+02	3.0E-02	7.8E+01	2.9E+01	1.8E+02	1.6E-01	
Mercury	7439-97-6	7.4E-05	5.3E-01	2.8E+00	1.5E+00	2.6E+00	1.4E+00	1.2E-01	4.5E-01	2.7E-01	
Nickel	7440-02-0	1.2E-02	9.8E+00	1.3E-01	1.3E+00	1.7E-01	1.6E+00	1.9E-01	6.7E+00	2.8E-02	
Selenium	7782-49-2	4.8E-03	1.4E+00	3.7E+00	5.1E+00	4.8E+00	6.7E+00	5.3E-01	2.9E-01	1.8E+00	
Total PAHs	TPAH	5.0E-04	6.1E+01	2.3E+00	1.4E+02	2.0E-01	1.2E+01	3.5E+00	2.0E+00	1.7E+00	
Zinc	7440-66-6	5.4E-02	4.1E+02	8.4E-01	3.4E+02	1.4E-01	5.6E+01	1.2E+01	6.6E+01	1.8E-01	

$$\text{Dose} = (\text{WI} \times \text{Water Conc}) + (\text{FI} \times \text{Sed Conc.} \times \text{UFbenthics} \times 0.20) + (\text{FI} \times \text{Sed Conc.} \times \text{Uffish} \times 0.80) + (\text{SI} \times \text{Sed Conc.})/\text{BW}$$

Note that the workplan states that diet consists of 5% of aquatic insects, 70% fish and 5% amphibians. These portions of diet are represented by sed conc. X fish UF.

Fish ingestion is considered to be 80% and benthic invertebrate proportion is assumed to be 20%.

Snowy egret is surrogate species for special status species and therefore only NOAEL evaluation is conducted.

East Ditch Marine (North Segment) - Conservative Analysis
Brine Service Company Superfund Site

Northern Portion of East Ditch															NOAEL	
Raccoon															Toxicity Reference Value	NOAEL Hazard Quotient
COC	CAS No.	Max Surface Water Conc (mg/L)	Max Sediment Conc (mg/kg)	Aquatic Plant UF (unitless)	Aquatic Plant Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Aquatic Insect UF (unitless)	Aquatic Insect Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Amphibian UF (unitless)	Amphibian Conc (mg/kg)	Total Daily Dose (mg/kg BW-day)	(mg/kg BW-day)	
alpha-Chlordane	5103-71-9	7.5E-06	1.1E-01	1.8E-03	8.1E+00	8.9E-02	2.3E+01	2.5E-01	2.3E+01	2.5E-01	8.1E+00	8.9E-02	6.1E-03	2.0E+00	3.1E-03	
Arsenic	7440-38-2	1.6E-02	3.8E+01	3.8E-02	1.4E+00	1.3E-01	4.8E+00	2.3E-01	8.5E+00	2.3E-01	1.3E-01	4.8E+00	4.5E-01	1.0E+00	4.3E-01	
Barium	7440-39-3	6.4E-01	4.7E+03	1.6E-01	7.4E+02	2.8E+00	1.3E+04	2.8E-01	1.3E+03	2.8E-01	1.3E+04	4.8E+02	5.2E+01	9.1E+00		
Bis(2-ethylhexyl)phthalate	117-81-7	1.1E-03	1.6E+00	7.0E-02	1.1E-01	7.4E+00	1.2E+01	1.5E+01	2.4E+01	1.5E+01	2.4E+01	7.4E+00	1.2E+01	7.0E-01	4.4E+01	1.6E-02
Butylbenzylphthalate	85-68-7	5.0E-05	1.3E-02	6.6E-01	8.5E-03	6.0E+00	7.8E-02	1.0E-01	1.3E-03	1.0E-01	1.3E-03	6.0E+00	7.8E-02	2.7E-03	8.2E+02	3.3E-06
Cadmium	7440-43-9	8.0E-04	3.8E+00	5.9E-01	2.2E+00	4.6E-01	1.7E+00	4.2E-01	1.6E+00	4.2E-01	1.6E+00	4.6E-01	1.7E+00	1.0E-01	7.7E-01	1.3E-01
Carbazole	86-74-8	5.0E-05	7.7E-01	1.2E+01	9.4E+00	3.3E+00	2.5E+00	1.0E+00	7.9E-01	1.0E+00	7.9E-01	3.3E+00	2.5E+00	1.2E-01	6.6E+01	1.8E-03
Cobalt	7440-48-4	6.6E-03	1.5E+01	7.5E-03	1.1E-01	3.0E-01	4.4E+00	1.7E-01	2.5E+00	1.7E-01	2.5E+00	3.0E-01	4.4E+00	2.4E-01	7.3E+00	3.3E-02
Copper	7440-50-8	3.4E-03	9.2E+01	1.2E-01	1.1E+01	6.6E-01	6.0E+01	3.6E-01	3.3E+01	3.6E-01	3.3E+01	6.6E-01	6.0E+01	2.9E+00	5.6E+00	5.1E-01
Cyanide	57-12-5	4.0E-03	3.0E+00	1.3E-01	3.9E-01	3.0E-01	9.1E-01	1.7E-01	5.2E-01	1.7E-01	5.2E-01	3.0E-01	9.1E-01	5.2E-02	6.9E+01	7.6E-04
Endosulfan sulfate	1031-07-8	6.1E-06	2.3E-02	1.3E-02	2.9E-04	3.2E+01	7.4E-01	3.5E+04	8.1E+02	3.0E+04	6.9E+02	3.9E+00	9.0E-02	8.7E+00	4.0E+00	2.2E+00
Heptachlor	76-44-8	1.4E-05	2.3E-02	2.4E+00	5.6E-02	6.9E+01	1.6E+00	7.5E+01	1.7E+00	7.5E+01	1.7E+00	6.9E+01	1.6E+00	7.4E-02	1.0E-01	7.4E-01
High Molecular Weight PAHs	HPAH	5.0E-04	4.0E+01	3.4E-01	1.4E+01	2.4E+00	9.5E+01	6.4E-02	2.6E+00	6.4E-02	2.6E+00	2.4E+00	9.5E+01	3.4E+00	6.2E-01	5.5E+00
Lead	7439-92-1	2.4E-03	2.3E+02	2.7E-01	6.0E+01	8.0E-02	1.8E+01	1.9E-01	4.2E+01	1.9E-01	4.2E+01	8.0E-02	1.8E+01	2.3E+00	4.7E+00	5.0E-01
Low Molecular Weight PAHs	LPAH	5.0E-04	5.6E+00	4.6E+00	2.6E+01	2.3E+00	1.3E+01	4.3E-01	2.4E+00	4.3E-01	2.4E+00	2.3E+00	1.3E+01	5.4E-01	6.6E+01	8.2E-03
Manganese	7439-96-5	2.7E+00	2.6E+03	7.9E-02	2.1E+02	1.9E-01	4.9E+02	3.0E-02	7.8E+01	3.0E-02	7.8E+01	1.9E-01	4.9E+02	3.0E+01	5.2E+01	5.9E-01
Mercury	7439-97-6	7.4E-05	5.3E-01	6.5E-01	3.5E-01	2.8E+00	1.5E+00	2.6E+00	1.4E+00	2.6E+00	1.4E+00	2.8E+00	1.5E+00	7.1E-02	3.8E-01	1.9E-01
Nickel	7440-02-0	1.2E-02	9.8E+00	1.8E-02	1.8E-01	1.3E-01	1.3E+00	1.7E-01	1.6E+00	1.7E-01	1.6E+00	1.3E-01	1.3E+00	1.1E-01	1.7E+00	6.5E-02
Selenium	7782-49-2	4.8E-03	1.4E+00	6.7E-01	9.3E-01	3.7E+00	5.1E+00	4.8E+00	6.7E+00	4.8E+00	6.7E+00	3.7E+00	5.1E+00	2.6E-01	1.4E-01	1.8E+00
Total PAHs	TPAH	5.0E-04	6.1E+01	2.2E+00	1.4E+02	2.3E+00	1.4E+02	2.0E-01	1.2E+01	2.0E-01	1.2E+01	2.3E+00	1.4E+02	5.4E+00	6.2E-01	8.8E+00
Zinc	7440-66-6	5.4E-02	4.1E+02	3.7E-01	1.5E+02	8.4E-01	3.4E+02	1.4E-01	5.6E+01	1.4E-01	5.6E+01	8.4E-01	3.4E+02	1.4E+01	7.5E+01	1.9E-01

Dose = (WI x Water Conc) + (FI x Sed Conc. X UFbenthics x 0.55) + (FI x Sed Conc. X Uffish x 0.25) + (FI x Sed Conc. X UF Aq Plant x 0.05) +(FI x Sed Conc. X Ufamphib x 0.1) + (FI x Sed Conc. X UF insect x 0.05)+(SI x Sed Conc.)/BW

Summary of Oral Hazard Quotients for Aquatic Avian and Mammalian Receptors in the North Area of Ditch

COPC	CAS No.	Snowy Egret NOAEL-HQ	Raccoon	
			NOAEL-HQ	LOAEL-HQ
alpha-Chlordane	5103-71-9	8.4E-03	3.1E-03	2.1E-03
Arsenic	7440-38-2	3.9E-01	4.3E-01	2.7E-01
Barium	7440-39-3	1.6E+01	9.1E+00	5.8E+00
Bis(2-ethylhexyl)phthalate	117-81-7	5.2E+00	1.6E-02	7.7E-03
Butylbenzylphthalate	85-68-7	4.2E-03	3.3E-06	2.2E-06
Cadmium	7440-43-9	1.1E-01	1.3E-01	1.3E-02
Carbazole	86-74-8	5.9E-05	1.8E-03	3.7E-04
Cobalt	7440-48-4	4.2E-02	3.3E-02	1.3E-02
Copper	7440-50-8	9.2E-01	5.1E-01	3.1E-01
Cyanide	57-12-5	1.0E-01	7.6E-04	7.6E-05
Endosulfan sulfate	1031-07-8	7.0E+02	2.2E+00	1.1E+00
Heptachlor	76-44-8	8.2E-02	7.4E-01	7.4E-02
High Molecular Weight PAHs	HPAH	9.8E-01	5.5E+00	1.1E+00
Lead	7439-92-1	2.7E+00	5.0E-01	2.6E-01
Low Molecular Weight PAHs	LPAH	2.4E-04	8.2E-03	1.6E-03
Manganese	7439-96-5	1.6E-01	5.9E-01	2.1E-01
Mercury	7439-97-6	2.7E-01	1.9E-01	3.7E-02
Nickel	7440-02-0	2.8E-02	6.5E-02	3.3E-02
Selenium	7782-49-2	1.8E+00	1.8E+00	1.2E+00
Total PAHs	TPAH	1.7E+00	8.8E+00	1.8E+00
Zinc	7440-66-6	1.8E-01	1.9E-01	4.8E-02

Appendix E-2 – Less-conservative Risk Assessment Calculations

South Pit Soils
SLERA HQ Calculations
Less-Conservative Analysis
EPC = 95% UCL
AUF = 1
NOAEL-based and LOAEL-based HQs

South Pit Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus Linneaus</i>	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	1.50E-02	i	NA	2.8	d	4.20E-04	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Based on Nagy 2001 for carnivorous reptiles.										

South Pit Soil
Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	Terrestrial			
Document Type:	SLERA			
Location:	Exposure Area = 6.9 acres South Pit			
Risk from which Medium:	Soil (Less-Conservative HQs)			
Surface Water Data:	Surface Water data from North Portion of East Ditch			
COPCs	Maximum Surface Water Conc. (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	95 % Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	95 % Soil Conc. (0-2 ft) (mg/kg)
Barium	6.39E-01	576.40	1165	888.4
Cadmium	8.00E-04	3.06	6.44	4.404
Chromium	6.41E-04	40.85	78.89	60.56
Copper	3.44E-03	40.56	78.48	55.39
Lead	2.38E-03	116	127.90	115.70
Nickel	1.22E-02	7.829	17.63	13.27
Selenium	4.76E-03	0.911	1.302	1.103
Zinc	5.42E-02	942.7	817.40	803.30
Mercury	7.40E-05	1.696	4.43	2.873
4,4'-DDT	4.80E+01	0.00881	0.019	0.0132
High Molecular Weight PAHs	4.97E-04	0.476	5.388	2.827
Detection limit in surface water used as surface water concentration if COPC not detected.				

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Less-Conservative HQs)

Exposure Area = 6.9 acres

Red-tailed Hawk

COC	EMF	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium		6.4E-01	5.8E+02	5.7E-02	3.3E+01	2.9E+00	2.1E+01	4.2E+01	1.4E-01	6.9E-02
Cadmium	1	8.0E-04	3.1E+00	5.2E-01	1.6E+00	9.7E-02	1.5E+00	6.4E+00	6.6E-02	1.5E-02
Chromium	1	6.4E-04	4.1E+01	8.5E-02	3.5E+00	2.7E-01	2.7E+00	1.6E+01	1.0E-01	1.7E-02
Copper	1	3.4E-03	4.1E+01	2.4E-01	9.8E+00	6.3E-01	4.1E+00	1.2E+01	1.6E-01	5.2E-02
Lead	1	2.4E-03	1.2E+02	7.4E-02	8.6E+00	6.8E-01	1.6E+00	3.3E+00	4.2E-01	2.1E-01
Nickel	1	1.2E-02	7.8E+00	1.1E-01	8.9E-01	6.5E-02	6.7E+00	1.9E+01	9.7E-03	3.5E-03
Selenium	1	4.8E-03	9.1E-01	5.2E-01	4.8E-01	2.9E-02	2.9E-01	5.8E-01	1.0E-01	5.0E-02
Zinc	1	5.42E-02	9.4E+02	5.7E-01	5.4E+02	3.2E+01	6.6E+01	1.7E+02	4.9E-01	1.9E-01
Mercury	1	7.40E-05	1.7E+00	5.4E-02	9.2E-02	8.1E-03	4.5E-01	9.0E-01	1.8E-02	9.0E-03
4,4'-DDT	1	4.80E+01	8.8E-03	2.0E+00	1.8E-02	2.9E+00	2.3E-01	2.3E+00	1.3E+01	1.3E+00
4,4'-DDT	0.004	4.80E+01	8.8E-03	2.0E+00	1.8E-02	1.2E-02	2.3E-01	2.3E+00	5.1E-02	5.1E-03
High Molecular Weight PAHs	1	4.97E-04	4.8E-01	1.0E-05	4.8E-06	8.2E-04	2.0E+00	2.0E+01	4.1E-04	4.1E-05

Hawk consumes 100% terrestrial mammals in model.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.004 is based on the exposure area of 6.9 acres and home range of 1722 acres.

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Less-Conservative HQs) Exposure Area = 6.9 acres American Robin											
COC	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	5.8E+02	9.10E-02	5.25E+01	1.6E-01	9.0E+01	1.4E+01	2.08E+01	4.17E+01	6.96E-01	3.47E-01
Cadmium	8.0E-04	3.1E+00	7.71E+00	2.36E+01	5.9E-01	1.8E+00	1.83E+00	1.47E+00	6.35E+00	1.2E+00	2.9E-01
Chromium	6.4E-04	4.1E+01	3.06E-01	1.25E+01	4.1E-02	1.7E+00	1.31E+00	2.66E+00	1.56E+01	4.9E-01	8.4E-02
Copper	3.4E-03	4.1E+01	5.15E-01	2.09E+01	1.2E-01	5.0E+00	2.14E+00	4.05E+00	1.21E+01	5.3E-01	1.8E-01
Lead	2.4E-03	1.2E+02	3.89E-02	4.51E+00	2.7E-01	3.1E+01	3.38E+00	1.63E+00	3.26E+00	2.1E+00	1.0E+00
Nickel	1.2E-02	7.8E+00	1.06E+00	8.29E+00	1.8E-02	1.4E-01	6.60E-01	6.71E+00	1.86E+01	9.8E-02	3.6E-02
Selenium	4.8E-03	9.1E-01	9.85E-01	8.97E-01	6.7E-01	6.1E-01	1.15E-01	2.90E-01	5.79E-01	4.0E-01	2.0E-01
Zinc	5.4E-02	9.4E+02	3.20E+00	3.02E+03	3.7E-01	3.5E+02	2.46E+02	6.61E+01	1.71E+02	3.7E+00	1.4E+00
Mercury	7.4E-05	1.7E+00	1.69E+00	2.87E+00	6.5E-01	1.1E+00	2.96E-01	4.50E-01	9.00E-01	6.6E-01	3.3E-01
4,4'-DDT	4.8E+01	8.8E-03	9.95E+00	8.77E-02	6.2E-02	5.5E-04	6.84E+00	2.27E-01	2.27E+00	3.0E+01	3.0E+00
High Molecular Weight PAHs	5.0E-04	4.8E-01	1.77E+00	8.43E-01	3.4E-01	1.6E-01	7.51E-02	2.00E+00	2.00E+01	3.8E-02	3.8E-03
Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW Exposure modifying factor not applicable, home range < exposure area											

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit Soil (Less-Conservative HQs) Exposure Area = 6.9 acres Mourning Dove										
COC	EMF	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium		6.4E-01	5.8E+02	1.6E-01	9.0E+01	1.8E+01	2.1E+01	4.2E+01	8.4E-01	4.2E-01
Cadmium	1	8.0E-04	3.1E+00	5.9E-01	1.8E+00	2.5E-01	1.5E+00	6.4E+00	1.7E-01	4.0E-02
Chromium	1	6.4E-04	4.1E+01	4.1E-02	1.7E+00	6.7E-01	2.7E+00	1.6E+01	2.5E-01	4.3E-02
Copper	1	3.4E-03	4.1E+01	1.2E-01	5.0E+00	1.1E+00	4.1E+00	1.2E+01	2.6E-01	8.9E-02
Lead	1	2.4E-03	1.2E+02	2.7E-01	3.1E+01	5.1E+00	1.6E+00	3.3E+00	3.1E+00	1.6E+00
Lead	0.173	2.4E-03	1.2E+02	2.7E-01	3.1E+01	8.8E-01	1.6E+00	3.3E+00	5.4E-01	2.7E-01
Nickel	1	1.2E-02	7.8E+00	1.8E-02	1.4E-01	1.1E-01	6.7E+00	1.9E+01	1.6E-02	5.8E-03
Selenium	1	4.8E-03	9.1E-01	6.7E-01	6.1E-01	8.5E-02	2.9E-01	5.8E-01	2.9E-01	1.5E-01
Zinc	1	5.4E-02	9.4E+02	3.7E-01	3.5E+02	5.3E+01	6.6E+01	1.7E+02	8.0E-01	3.1E-01
Mercury	1	7.4E-05	1.7E+00	6.5E-01	1.1E+00	1.5E-01	4.5E-01	9.0E-01	3.4E-01	1.7E-01
4,4'-DDT	1	4.8E+01	8.8E-03	6.2E-02	5.5E-04	5.8E+00	2.3E-01	2.3E+00	2.6E+01	2.6E+00
4,4'-DDT	0.173	4.8E+01	8.8E-03	6.2E-02	5.5E-04	1.0E+00	2.3E-01	2.3E+00	4.5E+00	4.5E-01
High Molecular Weight PAHs	1	5.0E-04	4.8E-01	3.4E-01	1.6E-01	2.5E-02	2.0E+00	2.0E+01	1.3E-02	1.3E-03

Mourning Dove consumes 100% terrestrial plants.
Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW
Exposure modifying factor (EMF) of 0.173 is based on the exposure area of 6.9 acres and home range of 40 acres.

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Less-Conservative HQs)

Exposure Area = 6.9 acres

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	5.8E+02	9.10E-02	5.25E+01	1.6E-01	9.0E+01	1.2E+01	5.20E+01	8.27E+01	2.28E-01	1.43E-01
Cadmium	8.0E-04	3.1E+00	7.71E+00	2.36E+01	5.9E-01	1.8E+00	1.81E+00	7.70E-01	7.70E+00	2.4E+00	2.4E-01
Chromium	6.4E-04	4.1E+01	3.06E-01	1.25E+01	4.1E-02	1.7E+00	1.12E+00	2.40E+00	5.82E+01	4.7E-01	1.9E-02
Copper	3.4E-03	4.1E+01	5.15E-01	2.09E+01	1.2E-01	5.0E+00	1.95E+00	5.60E+00	9.34E+00	3.5E-01	2.1E-01
Lead	2.4E-03	1.2E+02	3.89E-02	4.51E+00	2.7E-01	3.1E+01	2.84E+00	4.70E+00	8.90E+00	6.0E-01	3.2E-01
Nickel	1.2E-02	7.8E+00	1.06E+00	8.29E+00	1.8E-02	1.4E-01	6.22E-01	1.70E+00	3.40E+00	3.7E-01	1.8E-01
Selenium	4.8E-03	9.1E-01	9.85E-01	8.97E-01	6.7E-01	6.1E-01	1.10E-01	1.43E-01	2.15E-01	7.7E-01	5.1E-01
Zinc	5.4E-02	9.4E+02	3.20E+00	3.02E+03	3.7E-01	3.5E+02	2.41E+02	7.54E+01	2.98E+02	3.2E+00	8.1E-01
Mercury	7.4E-05	1.7E+00	1.69E+00	2.87E+00	6.5E-01	1.1E+00	2.87E-01	3.80E-01	1.90E+00	7.6E-01	1.5E-01
4,4'-DDT	4.8E+01	8.8E-03	9.95E+00	8.77E-02	6.2E-02	5.5E-04	7.14E+00	1.47E-01	7.35E-01	4.9E+01	9.7E+00
High Molecular Weight PAHs	5.0E-04	4.8E-01	1.77E+00	8.43E-01	3.4E-01	1.6E-01	7.27E-02	6.15E-01	3.07E+00	1.2E-01	2.4E-02

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW

Exposure modifying factor not applicable, home range < exposure area

South Pit Soils - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Less-Conservative HQs)

Exposure Area = 6.9 acres

Eastern Cottontail

COC	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	5.8E+02	1.6E-01	9.0E+01	9.0E+00	5.2E+01	8.3E+01	1.7E-01	1.1E-01
Cadmium	8.0E-04	3.1E+00	5.9E-01	1.8E+00	1.4E-01	7.7E-01	7.7E+00	1.8E-01	1.8E-02
Chromium	6.4E-04	4.1E+01	4.1E-02	1.7E+00	3.2E-01	2.4E+00	5.8E+01	1.3E-01	5.5E-03
Copper	3.4E-03	4.1E+01	1.2E-01	5.0E+00	5.4E-01	5.6E+00	9.3E+00	9.7E-02	5.8E-02
Lead	2.4E-03	1.2E+02	2.7E-01	3.1E+01	2.6E+00	4.7E+00	8.9E+00	5.6E-01	3.0E-01
Nickel	1.2E-02	7.8E+00	1.8E-02	1.4E-01	5.1E-02	1.7E+00	3.4E+00	3.0E-02	1.5E-02
Selenium	4.8E-03	9.1E-01	6.7E-01	6.1E-01	4.6E-02	1.4E-01	2.2E-01	3.2E-01	2.1E-01
Zinc	5.4E-02	9.4E+02	3.7E-01	3.5E+02	2.8E+01	7.5E+01	3.0E+02	3.7E-01	9.3E-02
Mercury	7.4E-05	1.7E+00	6.5E-01	1.1E+00	8.2E-02	3.8E-01	1.9E+00	2.2E-01	4.3E-02
4,4'-DDT	4.8E+01	8.8E-03	6.2E-02	5.5E-04	5.8E+00	1.5E-01	7.4E-01	3.9E+01	7.8E+00
High Molecular Weight PAHs	5.0E-04	4.8E-01	3.4E-01	1.6E-01	1.3E-02	6.2E-01	3.1E+00	2.2E-02	4.3E-03

Eastern Cottontail consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.98 is based on the exposure area of 6.9 acres and home range of 7 acres. EMF not applied.

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit
Soil (Less-Conservative HQs)
Exposure Area = 6.9 acres
Coyote

COC	EMF	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium		6.4E-01	5.8E+02	5.7E-02	3.3E+01	2.1E+00	5.2E+01	8.3E+01	4.1E-02	2.6E-02
Cadmium	1	8.0E-04	3.1E+00	5.2E-01	1.6E+00	7.2E-02	7.7E-01	7.7E+00	9.4E-02	9.4E-03
Chromium	1	6.4E-04	4.1E+01	8.5E-02	3.5E+00	2.0E-01	2.4E+00	5.8E+01	8.2E-02	3.4E-03
Copper	1	3.4E-03	4.1E+01	2.4E-01	9.8E+00	4.7E-01	5.6E+00	9.3E+00	8.4E-02	5.0E-02
Lead	1	2.4E-03	1.2E+02	7.4E-02	8.6E+00	5.1E-01	4.7E+00	8.9E+00	1.1E-01	5.7E-02
Nickel	1	1.2E-02	7.8E+00	1.1E-01	8.9E-01	4.9E-02	1.7E+00	3.4E+00	2.9E-02	1.4E-02
Selenium	1	4.8E-03	9.1E-01	5.2E-01	4.8E-01	2.2E-02	1.4E-01	2.2E-01	1.5E-01	1.0E-01
Zinc	1	5.4E-02	9.4E+02	5.7E-01	5.4E+02	2.4E+01	7.5E+01	3.0E+02	3.2E-01	8.1E-02
Mercury	1	7.4E-05	1.7E+00	5.4E-02	9.2E-02	6.0E-03	3.8E-01	1.9E+00	1.6E-02	3.2E-03
4,4'-DDT	1	4.8E+01	8.8E-03	2.0E+00	1.8E-02	3.6E+00	1.5E-01	7.4E-01	2.5E+01	4.9E+00
4,4'-DDT	0.0013	4.8E+01	8.8E-03	2.0E+00	1.8E-02	4.7E-03	1.5E-01	7.4E-01	3.2E-02	6.4E-03
High Molecular Weight PAHs	1	5.0E-04	4.8E-01	1.0E-05	4.8E-06	6.1E-04	6.2E-01	3.1E+00	9.9E-04	2.0E-04

Coyote consumes 100% terrestrial mammals.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

**South Pit Soil - Less-
Conservative Analysis**

Brine Service Company Superfund Site

South Pit Soil (Less-Conservative HQs) Exposure Area = 6.9 acres Least Shrew									
COC	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	5.8E+02	9.1E-02	5.2E+01	1.3E+01	5.2E+01	8.3E+01	2.5E-01	1.6E-01
Cadmium	8.0E-04	3.1E+00	7.7E+00	2.4E+01	3.4E+00	7.7E-01	7.7E+00	4.4E+00	4.4E-01
Chromium	6.4E-04	4.1E+01	3.1E-01	1.3E+01	2.2E+00	2.4E+00	5.8E+01	9.0E-01	3.7E-02
Copper	3.4E-03	4.1E+01	5.2E-01	2.1E+01	3.4E+00	5.6E+00	9.3E+00	6.0E-01	3.6E-01
Lead	2.4E-03	1.2E+02	3.9E-02	4.5E+00	1.8E+00	4.7E+00	8.9E+00	3.8E-01	2.0E-01
Nickel	1.2E-02	7.8E+00	1.1E+00	8.3E+00	1.2E+00	1.7E+00	3.4E+00	7.4E-01	3.7E-01
Selenium	4.8E-03	9.1E-01	9.9E-01	9.0E-01	1.4E-01	1.4E-01	2.2E-01	9.5E-01	6.3E-01
Zinc	5.4E-02	9.4E+02	3.2E+00	3.0E+03	4.4E+02	7.5E+01	3.0E+02	5.8E+00	1.5E+00
Mercury	7.4E-05	1.7E+00	1.7E+00	2.9E+00	4.2E-01	3.8E-01	1.9E+00	1.1E+00	2.2E-01
4,4'-DDT	4.8E+01	8.8E-03	1.0E+01	8.8E-02	7.1E+00	1.5E-01	7.4E-01	4.8E+01	9.7E+00
High Molecular Weight PAHs	5.0E-04	4.8E-01	1.8E+00	8.4E-01	1.2E-01	6.2E-01	3.1E+00	2.0E-01	4.0E-02

Least Shrew consumes 100% terrestrial plants
Dose = (WI x Water Conc) + (FI x Soil Conc. X UF_{Invertebrates} x 1) + (SI x Soil Conc.)/BW

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Less-Conservative HQs)

Exposure Area = 6.9 acres

Texas Pocket Gopher

COC	Maximum Surface Water Conc (mg/L)	95 % Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.2E+03	1.6E-01	1.8E+02	2.2E+01	5.2E+01	8.3E+01	4.2E-01	2.6E-01
Cadmium	8.0E-04	6.4E+00	5.9E-01	3.8E+00	3.4E-01	7.7E-01	7.7E+00	4.4E-01	4.4E-02
Chromium	6.4E-04	7.9E+01	4.1E-02	3.2E+00	7.4E-01	2.4E+00	5.8E+01	3.1E-01	1.3E-02
Copper	3.4E-03	7.8E+01	1.2E-01	9.7E+00	1.3E+00	5.6E+00	9.3E+00	2.3E-01	1.4E-01
Lead	2.4E-03	1.3E+02	2.7E-01	3.4E+01	3.5E+00	4.7E+00	8.9E+00	7.5E-01	3.9E-01
Nickel	1.2E-02	1.8E+01	1.8E-02	3.2E-01	1.4E-01	1.7E+00	3.4E+00	8.0E-02	4.0E-02
Selenium	4.8E-03	1.3E+00	6.7E-01	8.7E-01	7.9E-02	1.4E-01	2.2E-01	5.5E-01	3.7E-01
Zinc	5.4E-02	8.2E+02	3.7E-01	3.0E+02	2.9E+01	7.5E+01	3.0E+02	3.8E-01	9.7E-02
Mercury	7.4E-05	4.4E+00	6.5E-01	2.9E+00	2.6E-01	3.8E-01	1.9E+00	6.8E-01	1.4E-01
4,4'-DDT	4.8E+01	1.9E-02	6.2E-02	1.2E-03	5.2E+00	1.5E-01	7.4E-01	3.5E+01	7.0E+00
High Molecular Weight PAHs	5.0E-04	5.4E+00	3.4E-01	1.8E+00	1.8E-01	6.2E-01	3.1E+00	2.9E-01	5.9E-02

Texas pocket gopher consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Texas pocket gopher is exposed to the 1-2 foot soil zone only.

South Pit Soil - Less-Conservative Analysis
Brine Service Company Superfund Site

South Pit Soil (Less-Conservative HQs) Exposure Area = 6.9 acres Nine-banded Armadillo													
COC	EMF	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	95 % Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium		6.4E-01	576.4	888.4	9.10E-02	5.25E+01	1.6E-01	9.0E+01	1.1E+01	5.20E+01	8.27E+01	2.10E-01	1.32E-01
Cadmium	1	8.0E-04	3.1	4.4	7.71E+00	2.36E+01	5.9E-01	1.8E+00	1.2E+00	7.70E-01	7.70E+00	1.51E+00	1.51E-01
Cadmium	0.863	8.0E-04	3.1	4.4	7.71E+00	2.36E+01	5.9E-01	1.8E+00	1.0E+00	7.70E-01	7.70E+00	1.30E+00	1.30E-01
Chromium	1	6.4E-04	40.9	60.6	3.06E-01	1.25E+01	4.1E-02	1.7E+00	1.1E+00	2.40E+00	5.82E+01	4.75E-01	1.96E-02
Copper	1	3.4E-03	40.6	55.4	5.15E-01	2.09E+01	1.2E-01	5.0E+00	1.5E+00	5.60E+00	9.34E+00	2.69E-01	1.61E-01
Lead	1	2.4E-03	116.0	115.7	3.89E-02	4.51E+00	2.7E-01	3.1E+01	1.4E+00	4.70E+00	8.90E+00	3.00E-01	1.58E-01
Nickel	1	1.2E-02	7.8	13.3	1.06E+00	8.29E+00	1.8E-02	1.4E-01	5.1E-01	1.70E+00	3.40E+00	3.01E-01	1.51E-01
Selenium	1	4.8E-03	0.9	1.1	9.85E-01	8.97E-01	6.7E-01	6.1E-01	5.6E-02	1.43E-01	2.15E-01	3.91E-01	2.60E-01
Zinc	1	5.4E-02	942.7	803.3	3.20E+00	3.02E+03	3.7E-01	3.5E+02	1.5E+02	7.54E+01	2.98E+02	2.01E+00	5.09E-01
Zinc	0.863	5.4E-02	942.7	803.3	3.20E+00	3.02E+03	3.7E-01	3.5E+02	1.3E+02	7.54E+01	2.98E+02	1.73E+00	4.40E-01
Mercury	1	7.4E-05	1.7	2.9	1.69E+00	2.87E+00	6.5E-01	1.1E+00	1.7E-01	3.80E-01	1.90E+00	4.40E-01	8.80E-02
4,4'-DDT	1	4.8E+01	0.009	0.013	9.95E+00	8.77E-02	6.2E-02	5.5E-04	4.1E+00	1.47E-01	7.35E-01	2.78E+01	5.56E+00
4,4'-DDT	0.863	4.8E+01	0.009	0.013	9.95E+00	8.77E-02	6.2E-02	5.5E-04	3.5E+00	1.47E-01	7.35E-01	2.40E+01	4.80E+00
High Molecular Weight PAHs	1	5.0E-04	0.476	2.827	1.77E+00	8.43E-01	3.4E-01	1.6E-01	6.6E-02	6.15E-01	3.07E+00	1.07E-01	2.15E-02

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Since heptachlor and 2,4-dimethylphenol were not detected in surface soil the 0-2 foot concentration was used to estimate food concentrations.

South Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

South Pit

Soil (Less-Conservative HQs)

Exposure Area = 6.9 acres

Texas Indigo Snake

COC	Maximum Surface Water Conc (mg/L)	95 % Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	6.4E-01	576.40	5.7E-02	3.3E+01	3.2E-01	2.1E+00	1.6E-01
Cadmium	8.0E-04	3.061	5.2E-01	1.6E+00	1.1E-02	1.5E-01	7.6E-02
Chromium	6.4E-04	40.85	8.5E-02	3.5E+00	3.1E-02	2.7E-01	1.1E-01
Copper	3.4E-03	40.56	2.4E-01	9.8E+00	7.2E-02	4.1E-01	1.8E-01
Lead	2.4E-03	116	7.4E-02	8.6E+00	7.8E-02	2.0E-01	3.9E-01
Nickel	1.2E-02	7.829	1.1E-01	8.9E-01	7.4E-03	6.7E-01	1.1E-02
Selenium	4.8E-03	0.91	5.2E-01	4.8E-01	3.3E-03	2.9E-02	1.1E-01
Zinc	5.4E-02	942.70	5.7E-01	5.4E+02	3.7E+00	6.6E+00	5.7E-01
Mercury	7.4E-05	1.696	5.4E-02	9.2E-02	9.3E-04	4.5E-02	2.1E-02
4,4'-DDT	4.8E+01	0.00881	2.0E+00	1.8E-02	1.2E-04	2.3E-02	5.3E-03
High Molecular Weight PAHs	5.0E-04	0.476	1.0E-05	4.8E-06	8.8E-05	2.0E-01	4.4E-04

Snake consumes 100% terrestrial mammals.

$$\text{Dose} = (\text{FI} \times \text{Soil Conc.} \times \text{UFmammals} \times 1) + (\text{SI} \times \text{Soil Conc.})/\text{BW}$$

North Pit Soils
SLERA HQ Calculations
Less - Conservative Analysis
EPC = 95% UCL
AUF = 1
NOAEL-based and LOAEL-based HQs

North Pit Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus Linneaus</i>	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	1.50E-02	j	NA	2.8	d	4.20E-04	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. <i>Physiol. Zool.</i> 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Nagy 2001 for carnivorous reptiles.										

North Pit Soil
Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	Terrestrial			
Document Type:	SLERA			
Location:	North Pit (Less-Conservative Analysis)			
	Exposure Area = 4.7 acres			
Risk from which Medium:	Soil			
Surface Water Data:	Surface Water data from North Portion of East Ditch			
COCs	Maximum Surface Water Conc. (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	95% UCL Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	95 % UCL Soil Conc. (0-2 ft) (mg/kg)
Barium	6.39E-01	1717	835.1	1798
Cadmium	8.00E-04	6.141	23.14	17.03
Chromium	6.41E-04	27.93	7.707	21.38
Copper	3.44E-03	17.4	112.9	67.77
Lead	2.38E-03	181.9	240.4	273.7
Nickel	1.22E-02	8.571	6.72	7.375
Selenium	4.76E-03	5.068	3.796	3.66
Zinc	5.42E-02	821.2	3121	1204
Mercury	7.40E-05	2.26	13.15	21.96
High Molecular Weight PAHs	4.97E-04	1.33	0.714	0.712
Bis(2-ethylhexyl)phthalate	1.10E-03	10.27	0.0129	8.519
Cyanide	4.00E-03	6.272	2.3	3.978
Detection limit in surface water used as surface water concentration if COPC not detected.				

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

Red-tailed Hawk

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1717.00	5.7E-02	9.7E+01	8.5E+00	2.1E+01	4.2E+01	4.1E-01	2.0E-01
Cadmium	1	8.0E-04	6.14	5.2E-01	3.2E+00	1.9E-01	1.5E+00	6.4E+00	1.3E-01	3.1E-02
Chromium	1	6.4E-04	27.93	8.5E-02	2.4E+00	1.8E-01	2.7E+00	1.6E+01	6.8E-02	1.2E-02
Copper	1	3.4E-03	17.40	2.4E-01	4.2E+00	2.7E-01	4.1E+00	1.2E+01	6.7E-02	2.2E-02
Lead	1	2.4E-03	181.90	7.4E-02	1.3E+01	1.1E+00	1.6E+00	3.3E+00	6.6E-01	3.3E-01
Nickel	1	1.2E-02	8.57	1.1E-01	9.8E-01	7.1E-02	6.7E+00	1.9E+01	1.1E-02	3.8E-03
Selenium	1	4.8E-03	5.07	5.2E-01	2.6E+00	1.6E-01	2.9E-01	5.8E-01	5.5E-01	2.8E-01
Zinc	1	5.42E-02	821.20	5.7E-01	4.7E+02	2.8E+01	6.6E+01	1.7E+02	4.3E-01	1.6E-01
Mercury	1	7.40E-05	2.26	5.4E-02	1.2E-01	1.1E-02	4.5E-01	9.0E-01	2.4E-02	1.2E-02
Bis(2-ethylhexyl)phthalate	1	1.10E-03	10.27	1.0E-01	1.0E+00	7.6E-02	3.5E-01	8.8E+00	2.2E-01	8.7E-03
High Molecular Weight PAHs	1	4.97E-04	1.33	1.0E-05	1.3E-05	2.2E-03	2.0E+00	2.0E+01	1.1E-03	1.1E-04
Cyanide	1	4.00E-03	6.27	4.1E-02	2.6E-01	2.5E-02	6.5E-01	3.3E+00	3.9E-02	7.8E-03

Hawk consumes 100% terrestrial mammals in model.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.00273 is based on the exposure area of 4.7 acres and home range of 1722 acres.

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)											
Exposure Area = 4.7 acres											
Soil											
American Robin											
COC	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.7E+03	9.10E-02	1.56E+02	1.6E-01	2.7E+02	4.30E+01	2.08E+01	4.17E+01	2.07E+00	1.03E+00
Cadmium	8.0E-04	6.1E+00	7.71E+00	4.73E+01	5.9E-01	3.6E+00	3.67E+00	1.47E+00	6.35E+00	2.50E+00	5.78E-01
Chromium	6.4E-04	2.8E+01	3.06E-01	8.55E+00	4.1E-02	1.1E+00	8.96E-01	2.66E+00	1.56E+01	3.37E-01	5.75E-02
Copper	3.4E-03	1.7E+01	5.15E-01	8.96E+00	1.2E-01	2.2E+00	9.20E-01	4.05E+00	1.21E+01	2.27E-01	7.61E-02
Lead	2.4E-03	1.8E+02	3.89E-02	7.08E+00	2.7E-01	4.8E+01	5.29E+00	1.63E+00	3.26E+00	3.25E+00	1.62E+00
Nickel	1.2E-02	8.6E+00	1.06E+00	9.08E+00	1.8E-02	1.5E-01	7.22E-01	6.71E+00	1.86E+01	1.08E-01	3.89E-02
Selenium	4.8E-03	5.1E+00	9.85E-01	4.99E+00	6.7E-01	3.4E+00	6.36E-01	2.90E-01	5.79E-01	2.19E+00	1.10E+00
Zinc	5.4E-02	8.2E+02	3.20E+00	2.63E+03	3.7E-01	3.0E+02	2.15E+02	6.61E+01	1.71E+02	3.25E+00	1.25E+00
Mercury	7.4E-05	2.3E+00	1.69E+00	3.83E+00	6.5E-01	1.5E+00	3.94E-01	4.50E-01	9.00E-01	8.75E-01	4.38E-01
Bis(2-ethylhexyl)phthalate	1.1E-03	1.0E+01	6.70E-01	6.88E+00	7.0E-02	7.2E-01	6.17E-01	3.48E-01	8.75E+00	1.77E+00	7.05E-02
High Molecular Weight PAHs	5.0E-04	1.3E+00	1.77E+00	2.35E+00	3.4E-01	4.5E-01	2.10E-01	2.00E+00	2.00E+01	1.05E-01	1.05E-02
Cyanide	4.0E-03	6.3E+00	3.01E-01	1.89E+00	1.3E-01	8.1E-01	2.39E-01	6.53E-01	3.26E+00	3.66E-01	7.33E-02
Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates. Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW Exposure modifying factor not applicable, home range < exposure area											

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.7E+03	9.10E-02	1.56E+02	1.6E-01	2.7E+02	3.51E+01	5.20E+01	8.27E+01	6.74E-01	4.24E-01
Cadmium	8.0E-04	6.1E+00	7.71E+00	4.73E+01	5.9E-01	3.6E+00	3.63E+00	7.70E-01	7.70E+00	4.72E+00	4.72E-01
Chromium	6.4E-04	2.8E+01	3.06E-01	8.55E+00	4.1E-02	1.1E+00	7.67E-01	2.40E+00	5.82E+01	3.20E-01	1.32E-02
Copper	3.4E-03	1.7E+01	5.15E-01	8.96E+00	1.2E-01	2.2E+00	8.39E-01	5.60E+00	9.34E+00	1.50E-01	8.98E-02
Lead	2.4E-03	1.8E+02	3.89E-02	7.08E+00	2.7E-01	4.8E+01	4.45E+00	4.70E+00	8.90E+00	9.47E-01	5.00E-01
Nickel	1.2E-02	8.6E+00	1.06E+00	9.08E+00	1.8E-02	1.5E-01	6.81E-01	1.70E+00	3.40E+00	4.01E-01	2.00E-01
Selenium	4.8E-03	5.1E+00	9.85E-01	4.99E+00	6.7E-01	3.4E+00	6.11E-01	1.43E-01	2.15E-01	4.27E+00	2.84E+00
Zinc	5.4E-02	8.2E+02	3.20E+00	2.63E+03	3.7E-01	3.0E+02	2.10E+02	7.54E+01	2.98E+02	2.79E+00	7.06E-01
Mercury	7.4E-05	2.3E+00	1.69E+00	3.83E+00	6.5E-01	1.5E+00	3.82E-01	3.80E-01	1.90E+00	1.01E+00	2.01E-01
Bis(2-ethylhexyl)phthalate	1.1E-03	1.0E+01	6.70E-01	6.88E+00	7.0E-02	7.2E-01	5.68E-01	4.40E+01	9.10E+01	1.29E-02	6.25E-03
High Molecular Weight PAHs	5.0E-04	1.3E+00	1.77E+00	2.35E+00	3.4E-01	4.5E-01	2.03E-01	6.15E-01	3.07E+00	3.30E-01	6.62E-02
Cyanide	4.0E-03	6.3E+00	3.01E-01	1.89E+00	1.3E-01	8.1E-01	2.10E-01	6.87E+01	6.87E+02	3.05E-03	3.05E-04

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW

Exposure modifying factor not applicable, home range < exposure area

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Soil

Exposure Area = 4.7 acres

Mourning Dove

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1717.00	1.6E-01	2.7E+02	5.2E+01	2.1E+01	4.2E+01	2.5E+00	1.3E+00
Barium	0.118	6.4E-01	1717.00	1.6E-01	2.7E+02	6.2E+00	2.1E+01	4.2E+01	3.0E-01	1.5E-01
Cadmium	1	8.0E-04	6.14	5.9E-01	3.6E+00	5.1E-01	1.5E+00	6.4E+00	3.5E-01	8.0E-02
Chromium	1	6.4E-04	27.93	4.1E-02	1.1E+00	4.6E-01	2.7E+00	1.6E+01	1.7E-01	2.9E-02
Copper	1	3.4E-03	17.40	1.2E-01	2.2E+00	4.6E-01	4.1E+00	1.2E+01	1.1E-01	3.8E-02
Lead	1	2.4E-03	181.90	2.7E-01	4.8E+01	8.0E+00	1.6E+00	3.3E+00	4.9E+00	2.4E+00
Lead	0.118	2.4E-03	181.90	2.7E-01	4.8E+01	9.4E-01	1.6E+00	3.3E+00	5.8E-01	2.9E-01
Nickel	1	1.2E-02	8.57	1.8E-02	1.5E-01	1.2E-01	6.7E+00	1.9E+01	1.7E-02	6.3E-03
Selenium	1	4.8E-03	5.07	6.7E-01	3.4E+00	4.7E-01	2.9E-01	5.8E-01	1.6E+00	8.2E-01
Selenium	0.118	4.8E-03	5.07	6.7E-01	3.4E+00	5.6E-02	2.9E-01	5.8E-01	1.9E-01	9.6E-02
Zinc	1	5.4E-02	821.20	3.7E-01	3.0E+02	4.6E+01	6.6E+01	1.7E+02	6.9E-01	2.7E-01
Mercury	1	7.4E-05	2.26	6.5E-01	1.5E+00	2.0E-01	4.5E-01	9.0E-01	4.6E-01	2.3E-01
Bis(2-ethylhexyl)phthalate	1	1.1E-03	10.27	7.0E-02	7.2E-01	2.0E-01	3.5E-01	8.8E+00	5.9E-01	2.3E-02
High Molecular Weight PAHs	1	5.0E-04	1.33	3.4E-01	0.0E+00	1.5E-02	2.0E+00	2.0E+01	7.6E-03	7.6E-04
Cyanide	1	4.0E-03	6.27	1.3E-01	8.1E-01	1.7E-01	6.5E-01	3.3E+00	2.6E-01	5.2E-02

Mourning Dove consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.118 is based on the exposure area of 4.7 acres and home range of 40 acres.

North Pit Soils - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

Eastern Cottontail

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1.7E+03	1.6E-01	2.7E+02	2.7E+01	5.2E+01	8.3E+01	5.1E-01	3.2E-01
Cadmium	1	8.0E-04	6.1E+00	5.9E-01	3.6E+00	2.7E-01	7.7E-01	7.7E+00	3.5E-01	3.5E-02
Chromium	1	6.4E-04	2.8E+01	4.1E-02	1.1E+00	2.2E-01	2.4E+00	5.8E+01	9.1E-02	3.8E-03
Copper	1	3.4E-03	1.7E+01	1.2E-01	2.2E+00	2.3E-01	5.6E+00	9.3E+00	4.2E-02	2.5E-02
Lead	1	2.4E-03	1.8E+02	2.7E-01	4.8E+01	4.1E+00	4.7E+00	8.9E+00	8.8E-01	4.7E-01
Nickel	1	1.2E-02	8.6E+00	1.8E-02	1.5E-01	5.5E-02	1.7E+00	3.4E+00	3.3E-02	1.6E-02
Selenium	1	4.8E-03	5.1E+00	6.7E-01	3.4E+00	2.5E-01	1.4E-01	2.2E-01	1.8E+00	1.2E+00
Selenium	0.671	4.8E-03	5.1E+00	6.7E-01	3.4E+00	1.7E-01	1.4E-01	2.2E-01	1.2E+00	7.9E-01
Zinc	1	5.4E-02	8.2E+02	3.7E-01	3.0E+02	2.4E+01	7.5E+01	3.0E+02	3.2E-01	8.1E-02
Mercury	1	7.4E-05	2.3E+00	6.5E-01	1.5E+00	1.1E-01	3.8E-01	1.9E+00	2.9E-01	5.8E-02
Bis(2-ethylhexyl)phthalate	1	1.1E-03	1.0E+01	7.0E-02	7.2E-01	1.0E-01	4.4E+01	9.1E+01	2.3E-03	1.1E-03
High Molecular Weight PAHs	1	5.0E-04	1.3E+00	3.4E-01	4.5E-01	3.7E-02	6.2E-01	3.1E+00	6.0E-02	1.2E-02
Cyanide	1	4.0E-03	6.3E+00	1.3E-01	8.1E-01	8.6E-02	6.9E+01	6.9E+02	1.3E-03	1.3E-04

Eastern Cottontail consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.671 is based on the exposure area of 4.7 acres and home range of 7 acres.

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

Coyote

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1.7E+03	5.7E-02	9.7E+01	6.3E+00	5.2E+01	8.3E+01	1.2E-01	7.6E-02
Cadmium	1	8.0E-04	6.1E+00	5.2E-01	3.2E+00	1.4E-01	7.7E-01	7.7E+00	1.9E-01	1.9E-02
Chromium	1	6.4E-04	2.8E+01	8.5E-02	2.4E+00	1.3E-01	2.4E+00	5.8E+01	5.6E-02	2.3E-03
Copper	1	3.4E-03	1.7E+01	2.4E-01	4.2E+00	2.0E-01	5.6E+00	9.3E+00	3.6E-02	2.2E-02
Lead	1	2.4E-03	1.8E+02	7.4E-02	1.3E+01	7.9E-01	4.7E+00	8.9E+00	1.7E-01	8.9E-02
Nickel	1	1.2E-02	8.6E+00	1.1E-01	9.8E-01	5.3E-02	1.7E+00	3.4E+00	3.1E-02	1.6E-02
Selenium	1	4.8E-03	5.1E+00	5.2E-01	2.6E+00	1.2E-01	1.4E-01	2.2E-01	8.4E-01	5.6E-01
Zinc	1	5.4E-02	8.2E+02	5.7E-01	4.7E+02	2.1E+01	7.5E+01	3.0E+02	2.8E-01	7.1E-02
Mercury	1	7.4E-05	2.3E+00	5.4E-02	1.2E-01	8.0E-03	3.8E-01	1.9E+00	2.1E-02	4.2E-03
Bis(2-ethylhexyl)phthalate	1	1.1E-03	1.0E+01	1.0E-01	1.0E+00	5.6E-02	4.4E+01	9.1E+01	1.3E-03	6.2E-04
High Molecular Weight PAHs	1	5.0E-04	1.3E+00	1.0E-05	1.3E-05	1.6E-03	6.2E-01	3.1E+00	2.7E-03	5.3E-04
Cyanide	1	4.0E-03	6.3E+00	4.1E-02	2.6E-01	1.9E-02	6.9E+01	6.9E+02	2.7E-04	2.7E-05

Coyote consumes 100% terrestrial mammals.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

Exposure modifying factor (EMF) of 0.001 is based on the exposure area of 4.7 acres and home range of 5485 acres.

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Soil

Least Shrew

COC	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	1.7E+03	9.1E-02	1.6E+02	3.9E+01	5.2E+01	8.3E+01	7.5E-01	4.7E-01
Cadmium	8.0E-04	6.1E+00	7.7E+00	4.7E+01	6.7E+00	7.7E-01	7.7E+00	8.8E+00	8.8E-01
Chromium	6.4E-04	2.8E+01	3.1E-01	8.5E+00	1.5E+00	2.4E+00	5.8E+01	6.2E-01	2.5E-02
Copper	3.4E-03	1.7E+01	5.2E-01	9.0E+00	1.4E+00	5.6E+00	9.3E+00	2.6E-01	1.5E-01
Lead	2.4E-03	1.8E+02	3.9E-02	7.1E+00	2.8E+00	4.7E+00	8.9E+00	6.0E-01	3.1E-01
Nickel	1.2E-02	8.6E+00	1.1E+00	9.1E+00	1.4E+00	1.7E+00	3.4E+00	8.0E-01	4.0E-01
Selenium	4.8E-03	5.1E+00	9.9E-01	5.0E+00	7.6E-01	1.4E-01	2.2E-01	5.3E+00	3.5E+00
Zinc	5.4E-02	8.2E+02	3.2E+00	2.6E+03	3.8E+02	7.5E+01	3.0E+02	5.0E+00	1.3E+00
Mercury	7.4E-05	2.3E+00	1.7E+00	3.8E+00	5.6E-01	3.8E-01	1.9E+00	1.5E+00	3.0E-01
Bis(2-ethylhexyl)phthalate	1.1E-03	1.0E+01	6.7E-01	6.9E+00	1.1E+00	4.4E+01	9.1E+01	2.4E-02	1.2E-02
High Molecular Weight PAHs	5.0E-04	1.3E+00	1.8E+00	2.4E+00	3.5E-01	6.2E-01	3.1E+00	5.6E-01	1.1E-01
Cyanide	4.0E-03	6.3E+00	3.0E-01	1.9E+00	3.3E-01	6.9E+01	6.9E+02	4.8E-03	4.8E-04

Least Shrew consumes 100% terrestrial plants

Dose = (WI x Water Conc) + (FI x Soil Conc. X UF_{Invertebrates} x 1) + (SI x Soil Conc.)/BW

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Soil

Texas Pocket Gopher

COC	Maximum Surface Water Conc (mg/L)	95% UCL Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	835.10	1.6E-01	1.3E+02	1.6E+01	5.2E+01	8.3E+01	3.0E-01	1.9E-01
Cadmium	8.0E-04	23.14	5.9E-01	1.4E+01	1.2E+00	7.7E-01	7.7E+00	1.6E+00	1.6E-01
Chromium	6.4E-04	7.71	4.1E-02	3.2E-01	7.3E-02	2.4E+00	5.8E+01	3.0E-02	1.3E-03
Copper	3.4E-03	112.90	1.2E-01	1.4E+01	1.8E+00	5.6E+00	9.3E+00	3.2E-01	1.9E-01
Lead	2.4E-03	240.40	2.7E-01	6.4E+01	6.6E+00	4.7E+00	8.9E+00	1.4E+00	7.4E-01
Nickel	1.2E-02	6.72	1.8E-02	1.2E-01	5.2E-02	1.7E+00	3.4E+00	3.1E-02	1.5E-02
Selenium	4.8E-03	3.80	6.7E-01	2.6E+00	2.3E-01	1.4E-01	2.2E-01	1.6E+00	1.1E+00
Zinc	5.4E-02	3121.00	3.7E-01	1.1E+03	1.1E+02	7.5E+01	3.0E+02	1.5E+00	3.7E-01
Mercury	7.4E-05	13.15	6.5E-01	8.6E+00	7.7E-01	3.8E-01	1.9E+00	2.0E+00	4.0E-01
Bis(2-ethylhexyl)phthalate	1.1E-03	0.01	7.0E-02	9.0E-04	2.7E-04	4.4E+01	9.1E+01	6.1E-06	3.0E-06
High Molecular Weight PAHs	5.0E-04	0.71	3.4E-01	2.4E-01	2.4E-02	6.2E-01	3.1E+00	3.9E-02	7.8E-03
Cyanide	4.0E-03	2.30	1.3E-01	3.0E-01	3.8E-02	6.9E+01	6.9E+02	5.6E-04	5.6E-05

Texas pocket gopher consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

Texas pocket gopher is exposed to the 1-2 foot soil zone only.

North Pit Soil - Less-Conservative Analysis
Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

Nine-banded Armadillo

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	95 % UCL Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1,717	1,798	9.10E-02	1.56E+02	1.6E-01	2.7E+02	2.49E+01	5.20E+01	8.27E+01	4.8E-01	3.0E-01
Cadmium	1	8.0E-04	6.14	17.03	7.71E+00	4.73E+01	5.9E-01	3.6E+00	2.41E+00	7.70E-01	7.70E+00	3.1E+00	3.1E-01
Cadmium	0.588	8.0E-04	6.14	17.03	7.71E+00	4.73E+01	5.9E-01	3.6E+00	1.42E+00	7.70E-01	7.70E+00	1.8E+00	1.8E-01
Chromium	1	6.4E-04	27.93	21.38	3.06E-01	8.55E+00	4.1E-02	1.1E+00	6.01E-01	2.40E+00	5.82E+01	2.5E-01	1.0E-02
Copper	1	3.4E-03	17.40	67.77	5.15E-01	8.96E+00	1.2E-01	2.2E+00	1.04E+00	5.60E+00	9.34E+00	1.9E-01	1.1E-01
Lead	1	2.4E-03	181.90	273.70	3.89E-02	7.08E+00	2.7E-01	4.8E+01	3.03E+00	4.70E+00	8.90E+00	6.4E-01	3.4E-01
Nickel	1	1.2E-02	8.57	7.38	1.06E+00	9.08E+00	1.8E-02	1.5E-01	4.97E-01	1.70E+00	3.40E+00	2.9E-01	1.5E-01
Selenium	1	4.8E-03	5.07	3.66	9.85E-01	4.99E+00	6.7E-01	3.4E+00	2.87E-01	1.43E-01	2.15E-01	2.0E+00	1.3E+00
Selenium	0.588	4.8E-03	5.07	3.66	9.85E-01	4.99E+00	6.7E-01	3.4E+00	1.69E-01	1.43E-01	2.15E-01	1.2E+00	7.8E-01
Zinc	1	5.4E-02	821.20	1,204.00	3.20E+00	2.63E+03	3.7E-01	3.0E+02	1.37E+02	7.54E+01	2.98E+02	1.8E+00	4.6E-01
Zinc	0.588	5.4E-02	821.20	1,204.00	3.20E+00	2.63E+03	3.7E-01	3.0E+02	8.03E+01	7.54E+01	2.98E+02	1.1E+00	2.7E-01
Mercury	1	7.4E-05	2.26	21.96	1.69E+00	3.83E+00	6.5E-01	1.5E+00	3.85E-01	3.80E-01	1.90E+00	1.0E+00	2.0E-01
Bis(2-ethylhexyl)phthalate	1	1.1E-03	10.27	8.52	6.70E-01	6.88E+00	7.0E-02	7.2E-01	4.05E-01	4.40E+01	9.10E+01	9.2E-03	4.5E-03
High Molecular Weight PAHs	1	5.0E-04	1.33	0.71	1.77E+00	2.35E+00	3.4E-01	4.5E-01	1.20E-01	6.15E-01	3.07E+00	2.0E-01	3.9E-02
Cyanide	1	4.0E-03	6.27	3.98	3.01E-01	1.89E+00	1.3E-01	8.1E-01	1.29E-01	6.87E+01	6.87E+02	1.9E-03	1.9E-04

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Placeholder value of 0.00001 mg/kg for surface soil concentration of pentachlorophenol

North Pit Soil - Less-Conservative Analysis

Brine Service Company Superfund Site

North Pit (Less-Conservative Analysis)

Exposure Area = 4.7 acres

Soil

Texas Indigo Snake

COC	EMF	Maximum Surface Water Conc (mg/L)	95% UCL Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	1.7E+03	5.7E-02	9.7E+01	9.6E-01	2.1E+00	4.6E-01
Cadmium	1	8.0E-04	6.1E+00	5.2E-01	3.2E+00	2.2E-02	1.5E-01	1.5E-01
Chromium	1	6.4E-04	2.8E+01	8.5E-02	2.4E+00	2.1E-02	2.7E-01	7.8E-02
Copper	1	3.4E-03	1.7E+01	2.4E-01	4.2E+00	3.1E-02	4.1E-01	7.7E-02
Lead	1	2.4E-03	1.8E+02	7.4E-02	1.3E+01	1.2E-01	2.0E-01	6.1E-01
Nickel	1	1.2E-02	8.6E+00	1.1E-01	9.8E-01	8.1E-03	6.7E-01	1.2E-02
Selenium	1	4.8E-03	5.1E+00	5.2E-01	2.6E+00	1.8E-02	2.9E-02	6.4E-01
Zinc	1	5.4E-02	8.2E+02	5.7E-01	4.7E+02	3.3E+00	6.6E+00	4.9E-01
Mercury	1	7.4E-05	2.3E+00	5.4E-02	1.2E-01	1.2E-03	4.5E-02	2.7E-02
Bis(2-ethylhexyl)phthalate	1	1.1E-03	1.0E+01	1.0E-01	1.0E+00	8.7E-03	3.5E-02	2.5E-01
High Molecular Weight PAHs	1	5.0E-04	1.3E+00	1.0E-05	1.3E-05	2.5E-04	2.0E-01	1.2E-03
Cyanide	1	4.0E-03	6.3E+00	4.1E-02	2.6E-01	2.9E-03	6.5E-02	4.4E-02

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soils (South)
SLERA HQ Calculations
Less-Conservative Analysis
EPC = Maximum detected concentration
AUF = 1
NOAEL- based and LOAEL- based HQs

East Ditch Riparian Soil (South)
Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus</i> Linneaus	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	3.16E-01	j	NA	2.8	d	8.86E-03	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. Physiol. Zool. 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Petersen et al. 1998, food ingestion assumed to be 14% of body weight per day. (2.26 kg x 0.14 = 0.316 kg/day)										

East Ditch Riparian Soil (South)
Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial Plants	Terrestrial Invertebrates	Terrestrial Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

East Ditch Riparian Soils (South) - Less-Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	East Ditch Riparian Soil (South)			
Document Type:	SLERA			
Location:	East Ditch Riparian Soil (South) Exposure Area = 0.49 acres			
Risk from which Medium:	Soil (Less-Conservative HQs)			
Surface Water Data:	Surface Water data from North Portion of East Ditch			
COPCs	Maximum Surface Water Conc. (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Max Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Max Soil Conc. (0-2 ft) (mg/kg)
Barium	6.39E-01	4.67E+02	1.31E+03	1.31E+03
Selenium	4.76E-03	1.04E+00	1.43E+00	1.43E+00
Maximum detection limit in surface water used as surface water concentration if COPC not detected.				

East Ditch Riparian Soil (South) - Less-Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)**Soil (Less-Conservative HQs)****Exposure Area = 0.49 acres****Least Shrew**

COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	6.4E-01	4.7E+02	9.1E-02	4.2E+01	1.1E+01	5.2E+01	8.3E+01	2.1E-01	1.3E-01
Selenium	4.8E-03	1.0E+00	9.9E-01	1.0E+00	1.6E-01	1.4E-01	2.2E-01	1.1E+00	7.2E-01

Least Shrew consumes 100% terrestrial plants

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFInvertebrates x 1) + (SI x Soil Conc.)/BW

East Ditch Riparian Soil (South) - Less-Conservative Analysis

Brine Service Company Superfund Site

East Ditch Riparian Soil (South)

Soil (Less-Conservative HQs)

Exposure Area = 0.49 acres

Texas Indigo Snake

COC	EMF	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	1	6.4E-01	4.7E+02	5.7E-02	2.6E+01	5.5E+00	2.1E+00	2.7E+00
Barium	0.002	6.4E-01	4.7E+02	5.7E-02	2.6E+01	1.2E-02	2.1E+00	5.7E-03
Selenium	1	4.8E-03	1.0E+00	5.2E-01	5.4E-01	8.0E-02	2.9E-02	2.8E+00
Selenium	0.002	4.8E-03	1.0E+00	5.2E-01	5.4E-01	1.7E-04	2.9E-02	5.9E-03

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

SLERA NOAEL and LOAEL HQ Summary for Terrestrial Species at South Area Soils

East Ditch Riparian Soil (South)				
SLERA				
East Ditch Riparian Soil (South) Soil (Less-Conservative HQs)				
COPC	Least Shrew			Texas Indigo Snake
	NOAEL-HQ	LOAEL-HQ	Average TRV HQ	NOAEL-HQ
Barium	2.1E-01	1.3E-01	1.6E-01	2.7E+00
Selenium	1.1E+00	7.2E-01	8.7E-01	2.8E+00

**East Ditch (South Segment) Sediment as Soil
SLERA HQ Calculations
Less Conservative Analysis
EPC = 95% UCL
AUF = 1
NOAEL-based and LOAEL-based HQs**

East Ditch (South Segment) Sediment as Soil

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors - Terrestrial Assessments											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	Body Weight (kg)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (L/day)	Soil Ingestion (%)	Soil ingestion rate (kg/day)	EMF	Percent of Area Used		
Birds											
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Carnivore	1.028	a	5.90E-02	b	6.00E-02	b	2.8	d	1.65E-03
Mourning Dove	<i>Zenaida macroura</i>	Herbivore	0.115	a	1.40E-02	b	1.40E-02	b	9.3	d	1.30E-03
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Omnivore	0.0415	a	7.30E-03	b	7.00E-03	b	2	d	1.46E-04
American Robin	<i>Turdus migratorius</i>	Omnivore	0.0773	a	1.10E-02	b	1.10E-02	b	5.2	d	5.72E-04
Mammals											
White Footed Mouse	<i>Peromyscus leucopus</i>	Omnivore	0.0148	e	2.10E-03	c	2.20E-03	c	2	d	4.20E-05
Coyote	<i>Canis latrans</i>	Carnivore	14	g	6.00E-01	c	1.06E+00	c	2.8	d	1.68E-02
Least Shrew	<i>Cryptotis parva</i>	Insectivore	0.01558	e	2.20E-03	c	2.30E-03	c	7	f	1.54E-04
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Herbivore	1.218	e	8.10E-02	c	1.20E-01	c	6.3	f	5.10E-03
Texas Pocket Gopher	<i>Geomys personatus</i>	Herbivore	0.4	g	3.20E-02	c	4.30E-02	c	7.7	d	2.46E-03
Nine-banded Armadillo	<i>Dasypus novemcinctus Linneaus</i>	Omnivore	4	g	2.10E-01	c	3.40E-01	c	17	d	3.57E-02
Reptiles											
Texas Indigo Snake	<i>Drymarchon corais eremicus</i>	Carnivore	2.26	h	3.16E-01	j	NA	2.8	d	8.86E-03	1
Notes:											
a	To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).										
b	Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.										
	Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.										
c	Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.										
	Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.										
d	Beyer et. al. 1994 used as primary reference for the following: Soil ingestion rates for red-tailed hawk, coyote, and Texas indigo snake assumed to be 2.8% based on the red fox. Wild turkey used as surrogate for mourning dove due to similar ground-feeding habitats. Blue-winged teal used as surrogate for red-winged blackbird. Half of the soil ingestion rate of the American woodcock assumed for the American robin. 2% soil ingestion rate assumed for the white-footed mouse. Beyer et. al. (1994) reports < 2% in diet, so assumption of 2% is conservative for white-footed mouse. Soil ingestion taken directly from Beyer et. al. (1994) for armadillo. Black tailed prairie dog used as surrogate for the Texas Pocket Gopher.										
e	Wildlife Exposure Factors Handbook, (USEPA 1993), conservative mean body adult weights body weights and food ingestion rates for the deer mouse and short-tailed shrew were used to represent the white-footed mouse and least shrew, respectively. Geometric mean of body weights for both sexes is used for eastern cottontail and										
f	Soil ingestion rate for least shrew assumed to be 7% based on diet of snails, insects, sow bugs and other small animals (Beyer et al., 1994 and Schmidly and Bradley, 2016). Soil ingestion for jackrabbit of 6.3% assumed for eastern cottontail (Beyer and Fries 2003).										
g	To be conservative, the lower adult body weight was used (Davis and Schmidly 1994).										
h	Herps of Texas. www.herpssoftexas.org										
i	Petersen, C.C., B.M.Walton and A.F. Bennett. 1998. Intrapopulation Variation in Ecological Energetics of the Garter Snake (<i>Thamnophis sirtalis</i>) with analysis of the precision of doubly labeled water measurements. <i>Physiol. Zool.</i> 71:333-349. Listed in Cal/EcoTox database (www.oehha.gov).										
j	Based on Petersen et al. 1998, food ingestion assumed to be 14% of body weight per day. (2.26 kg x 0.14 = 0.316 kg/day)										

East Ditch (South Segment) Sediment as Soil

Brine Service Company Superfund Site

Percent of Components in Receptor Diet			
	Terrestrial	Terrestrial	Terrestrial
	Plants	Invertebrates	Mammals
Birds			
Red-tailed Hawk			1
American robin	0.5	0.5	
Mourning Dove	1		
Red-winged Blackbird	0.73	0.27	
Mammals			
White footed mouse	0.5	0.5	
Eastern Cottontail	1		
Coyote			1
Least Shrew		1	
Texas Pocket Gopher	1		
Nine-banded Armalillo	0.1	0.9	
Reptiles			
Texas Indigo Snake			1

Values represent the fraction of diet.

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis

Brine Service Company Superfund Site

Habitat Type:	East Ditch Sediment as Soil			
Document Type:	SLERA			
Location:	East Ditch (South Segment)			
Risk from which Medium:	Sediment as Soil (Less - Conservative HQs)			
Surface Water Data:	Surface Water data from South Portion of East Ditch			
COPCs	Maximum Surface Water Conc. (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Shallow Subsurface Soil Conc (1-2 ft) (mg/kg)	Soil Conc. (0-2 ft) (mg/kg)
Barium	3.01E-01	1347	1347	1347
Cadmium	6.00E-04	1.48	1.48	1.48
Copper	4.79E-03	12.47	12.47	12.47
Lead	1.33E-03	39.88	39.88	39.88
Selenium	2.50E-03	0.51	0.51	0.51
Vanadium	1.03E-02	15.00	15.00	15.00
Zinc	1.08E-02	242.90	242.90	242.90
Maximum detection limit in surface water used as surface water concentration if COPC not detected.				

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Less - Conservative HQs) American Robin											
COC	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	9.10E-02	1.23E+02	1.6E-01	2.1E+02	3.4E+01	2.08E+01	4.17E+01	1.6E+00	8.08E-01
Cadmium	6.0E-04	1.5E+00	7.71E+00	1.14E+01	5.9E-01	8.7E-01	8.83E-01	1.47E+00	6.35E+00	6.0E-01	1.39E-01
Copper	4.8E-03	1.2E+01	5.15E-01	6.42E+00	1.2E-01	1.5E+00	6.60E-01	4.05E+00	1.21E+01	1.6E-01	5.45E-02
Lead	1.3E-03	4.0E+01	3.89E-02	1.55E+00	2.7E-01	1.1E+01	1.16E+00	1.63E+00	3.26E+00	7.1E-01	3.56E-01
Selenium	2.5E-03	5.1E-01	9.85E-01	5.04E-01	6.7E-01	3.4E-01	6.45E-02	2.90E-01	5.79E-01	2.2E-01	1.11E-01
Vanadium	1.0E-02	1.5E+01	4.20E-02	6.30E-01	4.9E-03	7.3E-02	1.62E-01	9.88E-01	1.98E+00	1.6E-01	8.21E-02
Zinc	1.1E-02	2.4E+02	3.20E+00	7.78E+02	3.7E-01	8.9E+01	6.34E+01	6.61E+01	1.71E+02	9.6E-01	3.70E-01

Robin consumes 50% terrestrial plants and 50% terrestrial invertebrates.
Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X Ufinverts x 0.5) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Less - Conservative HQs)

Mourning Dove

COC	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0.5 foot) (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	1.6E-01	2.1E+02	4.1E+01	2.1E+01	4.2E+01	2.0E+00	9.8E-01
Cadmium	6.0E-04	1.5E+00	5.9E-01	8.7E-01	1.2E-01	1.5E+00	6.4E+00	8.3E-02	1.9E-02
Copper	4.8E-03	1.2E+01	1.2E-01	1.5E+00	3.3E-01	4.1E+00	1.2E+01	8.1E-02	2.7E-02
Lead	1.3E-03	4.0E+01	2.7E-01	1.1E+01	1.7E+00	1.6E+00	3.3E+00	1.1E+00	5.3E-01
Selenium	2.5E-03	5.1E-01	6.7E-01	3.4E-01	4.8E-02	2.9E-01	5.8E-01	1.7E-01	8.3E-02
Vanadium	1.0E-02	1.5E+01	4.9E-03	7.3E-02	1.8E-01	9.9E-01	2.0E+00	1.8E-01	9.1E-02
Zinc	1.1E-02	2.4E+02	3.7E-01	8.9E+01	1.4E+01	6.6E+01	1.7E+02	2.1E-01	7.9E-02

Mourning Dove consumes 100% terrestrial plants.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 1) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis
 Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Less - Conservative HQs) Red-winged Blackbird											
COC	Maximum Surface Water Conc (mg/L)	Max Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	9.10E-02	1.23E+02	1.6E-01	2.1E+02	3.76E+01	2.08E+01	4.17E+01	1.8E+00	9.02E-01
Cadmium	6.0E-04	1.5E+00	7.71E+00	1.14E+01	5.9E-01	8.7E-01	6.57E-01	1.47E+00	6.35E+00	4.5E-01	1.03E-01
Copper	4.8E-03	1.2E+01	5.15E-01	6.42E+00	1.2E-01	1.5E+00	5.48E-01	4.05E+00	1.21E+01	1.4E-01	4.53E-02
Lead	1.3E-03	4.0E+01	3.89E-02	1.55E+00	2.7E-01	1.1E+01	1.58E+00	1.63E+00	3.26E+00	9.7E-01	4.84E-01
Selenium	2.5E-03	5.1E-01	9.85E-01	5.04E-01	6.7E-01	3.4E-01	7.04E-02	2.90E-01	5.79E-01	2.4E-01	1.22E-01
Vanadium	1.0E-02	1.5E+01	4.20E-02	6.30E-01	4.9E-03	7.3E-02	9.38E-02	9.88E-01	1.98E+00	9.5E-02	4.74E-02
Zinc	1.1E-02	2.4E+02	3.20E+00	7.78E+02	3.7E-01	8.9E+01	4.92E+01	6.61E+01	1.71E+02	7.4E-01	2.87E-01

Red-winged blackbird consumes 73% terrestrial plants and 27% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.73) + (FI x Soil Conc. X UFinverts x 0.27) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Less - Conservative HQs)

White Footed Mouse

COC	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	9.10E-02	1.23E+02	1.6E-01	2.1E+02	2.7E+01	5.20E+01	8.27E+01	5.3E-01	3.32E-01
Cadmium	6.0E-04	1.5E+00	7.71E+00	1.14E+01	5.9E-01	8.7E-01	8.73E-01	7.70E-01	7.70E+00	1.1E+00	1.13E-01
Copper	4.8E-03	1.2E+01	5.15E-01	6.42E+00	1.2E-01	1.5E+00	6.01E-01	5.60E+00	9.34E+00	1.1E-01	6.44E-02
Lead	1.3E-03	4.0E+01	3.89E-02	1.55E+00	2.7E-01	1.1E+01	9.76E-01	4.70E+00	8.90E+00	2.1E-01	1.10E-01
Selenium	2.5E-03	5.1E-01	9.85E-01	5.04E-01	6.7E-01	3.4E-01	6.20E-02	1.43E-01	2.15E-01	4.3E-01	2.88E-01
Vanadium	1.0E-02	1.5E+01	4.20E-02	6.30E-01	4.9E-03	7.3E-02	9.40E-02	3.43E+00	6.85E+00	2.7E-02	1.37E-02
Zinc	1.1E-02	2.4E+02	3.20E+00	7.78E+02	3.7E-01	8.9E+01	6.22E+01	7.54E+01	2.98E+02	8.2E-01	2.09E-01

White footed mouse consumes 50% terrestrial plants and 50% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.5) + (FI x Soil Conc. X UFinverts x 0.5) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis
 Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Less - Conservative HQs) Least Shrew									
COC	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Invertebrate Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	9.1E-02	1.2E+02	3.1E+01	5.2E+01	8.3E+01	5.9E-01	3.7E-01
Cadmium	6.0E-04	1.5E+00	7.7E+00	1.1E+01	1.6E+00	7.7E-01	7.7E+00	2.1E+00	2.1E-01
Copper	4.8E-03	1.2E+01	5.2E-01	6.4E+00	1.0E+00	5.6E+00	9.3E+00	1.8E-01	1.1E-01
Lead	1.3E-03	4.0E+01	3.9E-02	1.6E+00	6.1E-01	4.7E+00	8.9E+00	1.3E-01	6.9E-02
Selenium	2.5E-03	5.1E-01	9.9E-01	5.0E-01	7.7E-02	1.4E-01	2.2E-01	5.4E-01	3.6E-01
Vanadium	1.0E-02	1.5E+01	4.2E-02	6.3E-01	2.4E-01	3.4E+00	6.9E+00	7.0E-02	3.5E-02
Zinc	1.1E-02	2.4E+02	3.2E+00	7.8E+02	1.1E+02	7.5E+01	3.0E+02	1.5E+00	3.8E-01

Least Shrew consumes 100% terrestrial plants Dose = (WI x Water Conc) + (FI x Soil Conc. X UF invertebrates x 1) + (SI x Soil Conc.)/BW

East Ditch (South Segment) Sediment as Soil -Less Conservative Analysis
 Brine Service Company Superfund Site

East Ditch (South Segment) Sediment as Soil (Less - Conservati Nine-banded Armadillo												
COC	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Soil Conc. (0-2 ft) (mg/kg)	Terrestrial Invertebrate UF (unitless)	Terrestrial Invertebrate Conc (mg/kg)	Plant UF (unitless)	Plant Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	LOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)	LOAEL Hazard Quotient (unitless)
Barium	3.0E-01	1.3E+03	1.3E+03	9.10E-02	1.23E+02	1.6E-01	2.1E+02	1.9E+01	5.20E+01	8.27E+01	3.64E-01	2.29E-01
Cadmium	6.0E-04	1.5E+00	1.5E+00	7.71E+00	1.14E+01	5.9E-01	8.7E-01	5.6E-01	7.70E-01	7.70E+00	7.22E-01	7.22E-02
Copper	4.8E-03	1.2E+01	1.2E+01	5.15E-01	6.42E+00	1.2E-01	1.5E+00	4.2E-01	5.60E+00	9.34E+00	7.56E-02	4.53E-02
Lead	1.3E-03	4.0E+01	4.0E+01	3.89E-02	1.55E+00	2.7E-01	1.1E+01	4.9E-01	4.70E+00	8.90E+00	1.03E-01	5.45E-02
Selenium	2.5E-03	5.1E-01	5.1E-01	9.85E-01	5.04E-01	6.7E-01	3.4E-01	3.0E-02	1.43E-01	2.15E-01	2.13E-01	1.41E-01
Vanadium	1.0E-02	1.5E+01	1.5E+01	4.20E-02	6.30E-01	4.9E-03	7.3E-02	1.6E-01	3.43E+00	6.85E+00	4.81E-02	2.41E-02
Zinc	1.1E-02	2.4E+02	2.4E+02	3.20E+00	7.78E+02	3.7E-01	8.9E+01	3.9E+01	7.54E+01	2.98E+02	5.22E-01	1.32E-01

Nine-banded Armadillo consumes 10% terrestrial plants and 90% terrestrial invertebrates.

Dose = (WI x Water Conc) + (FI x Soil Conc. X UFplants x 0.1) + (FI x Soil Conc. X Ufinverts x 0.9) + (SI x Soil Conc.)/BW

Note that the 0-6 inch soil zone concentration used for food web analysis and the 0-2 foot soil zone is used for incidental ingestion. Since heptachlor and 2,4-dimethylphenol were not detected in surface soil the 0-2 foot concentration was used to estimate food concentrations.

East Ditch (South Segment) Sediment as Soil - Less Conservative Analysis

Brine Service Company Superfund Site

East Ditch (South Segment)

Sediment as Soil (Less - Conservative HQs)

Texas Indigo Snake

COC	EMF	Maximum Surface Water Conc (mg/L)	95 % UCL Surface Soil (0-0.5 foot) (mg/kg)	Mammal UF (unitless)	Mammal (Prey) Tissue Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	1	3.0E-01	1.3E+03	5.7E-02	7.6E+01	1.6E+01	2.1E+00	7.7E+00
Barium	0.003	3.0E-01	1.3E+03	5.7E-02	7.6E+01	4.8E-02	2.1E+00	2.3E-02
Cadmium	1	6.0E-04	1.5E+00	5.2E-01	7.7E-01	1.1E-01	1.5E-01	7.7E-01
Copper	1	4.8E-03	1.2E+01	2.4E-01	3.0E+00	4.7E-01	4.1E-01	1.2E+00
Copper	0.003	4.8E-03	1.2E+01	2.4E-01	3.0E+00	1.4E-03	4.1E-01	3.5E-03
Lead	1	1.3E-03	4.0E+01	7.4E-02	2.9E+00	5.7E-01	2.0E-01	2.8E+00
Lead	0.003	1.3E-03	4.0E+01	7.4E-02	2.9E+00	1.7E-03	2.0E-01	8.5E-03
Selenium	1	2.5E-03	5.1E-01	5.2E-01	2.7E-01	3.9E-02	2.9E-02	1.4E+00
Selenium	0.003	2.5E-03	5.1E-01	5.2E-01	2.7E-01	1.2E-04	2.9E-02	4.1E-03
Vanadium	1	1.0E-02	1.5E+01	1.2E-02	1.8E-01	8.5E-02	9.9E-02	8.6E-01
Zinc	1	1.1E-02	2.4E+02	5.7E-01	1.4E+02	2.0E+01	6.6E+00	3.1E+00
Zinc	0.003	1.1E-02	2.4E+02	5.7E-01	1.4E+02	6.1E-02	6.6E+00	9.2E-03

Snake consumes 100% terrestrial mammals.

Dose = (FI x Soil Conc. X UFmammals x 1) + (SI x Soil Conc.)/BW

East Ditch Sediment (South)
SLERA HQ Calculations
Less Conservative Analysis
EPC = 95% UCL
AUF = 1
NOAEL-based and LOAEL-based HQs

East Ditch Sediment South
Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors											
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	EMF	Body Weight (kg)		Food Ingestion Rate (kg/day DW)		Water Ingestion Rate (L/day)	Sediment Ingestion (% of diet)		Sediment Ingestion rate (kg/day)
Birds											
Snowy Egret	<i>Egretta thula</i>	Invertevore/Carnivore	1	0.371	a	0.03050	b	0.03	b	7.3	d 0.0022
Mammals											
Raccoon	<i>Procyon lotor</i>	Omnivore	1	5.63	e	0.284	c	0.468	c	9.4	d 0.0267
Notes:											
a To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).											
b Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt ^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.											
Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt ^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.											
c Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt ^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.											
Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt ^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.											
d Estimates of Soil Ingestion by Wildlife (Beyer, 1994). Soil/Sediment ingestion taken directly from Beyer (1994). Least sandpiper used as surrogate. Egrets do not forage as deep in sediment as sandpipers.											
e Wildlife Exposure Factors Handbook (USEPA, 1993). Geometric mean of body weights for both sexes is used for raccoon.											

East Ditch Sediment (South)
Brine Service Company Superfund Site

Common Name	Percent of Components in Receptor Diet		Aquatic Vascular	Benthic Invertebrates	Fish	Amphibians
	Aquatic	Plants				
	Insects					
Birds						
Snowy Egret		5		20	70	5
Mammals						
Raccoon	5	5		55	25	10

East Ditch Sediment (South) - Conservative Analysis

Brine Service Company Superfund Site

Location:	Southern Portion of East Ditch		
	Exposure Point Concentrations		
		Max Surface Water	95% UCL Sediment
COCs	CAS No.	mg/L	mg/kg
Barium	7440-39-3	0.301	1347
Bis(2-ethylhexyl)phthalate	117-81-7	0.0026	0.258

East Ditch Sediment (South) - Conservative Analysis

Brine Service Company Superfund Site

Southern Portion of East Ditch											
Snowy Egret											
COC	EMF	CAS No.	Max Surface Water Conc (mg/L)	95% UCL Sediment Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	1	7440-39-3	3.0E-01	1.3E+03	2.8E+00	3.8E+03	2.8E-01	3.8E+02	9.5E+01	2.1E+01	4.6E+00
Barium	0.029	7440-39-3	3.0E-01	1.3E+03	2.8E+00	3.8E+03	2.8E-01	3.8E+02	2.8E+00	2.1E+01	1.3E-01
Bis(2-ethylhexyl)phthalate	1	117-81-7	2.6E-03	2.6E-01	7.4E+00	1.9E+00	1.5E+01	3.9E+00	2.9E-01	3.5E-01	8.4E-01

$$\text{Dose} = (\text{WI} \times \text{Water Conc}) + (\text{FI} \times \text{Sed Conc.} \times \text{UFbenthics} \times 0.20) + (\text{FI} \times \text{Sed Conc.} \times \text{Uffish} \times 0.80) + (\text{SI} \times \text{Sed Conc.})/\text{BW}$$

Note that the workplan states that diet consists of 5% of aquatic insects, 70% fish and 5% amphibians. These portions of diet are represented by sed conc. X fish UF.

Fish ingestion is considered to be 80% and benthic invertebrate proportion is assumed to be 20%.

Snowy egret is surrogate species for special status species and therefore only NOAEL evaluation is conducted.

East Ditch Sediment (South) - Conservative Analysis
Brine Service Company Superfund Site

Southern Portion of East Ditch																			NOAEL		LOAEL		NOAEL	
Raccoon			Conservative Analysis																NOAEL	Toxicity	Toxicity	Toxicity	Hazard	
COC	CAS No.	EMF	Max	Surface	95% UCL	Aquatic				Benthic				Aquatic				Total Daily	NOAEL	Toxicity	Toxicity	Toxicity	Hazard	
			Water Conc (mg/L)	Sediment Conc (mg/kg)	(unitless)	Aquatic Plant UF	Aquatic Plant Conc (mg/kg)	Benthic Invertebrate UF	Benthic Invertebrate Conc (mg/kg)	Aquatic Insect UF	Aquatic Insect Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Amphibian UF (unitless)	Amphibian Conc (mg/kg)	BW-day)	Dose (mg/kg BW-day)	Reference Value (mg/kg BW-day)	Reference Value (mg/kg BW-day)	Reference Value (mg/kg BW-day)	Quotient (unitless)			
Barium	7440-39-3	1	3.0E-01	1.35E+03	1.6E-01	2.1E+02	2.8E+00	3.8E+03	2.8E-01	3.8E+02	2.8E-01	3.8E+02	2.8E+00	3.8E+03	1.4E+02	5.2E+01	8.3E+01	8.3E+01	8.3E+01	2.6E+00				
Barium	7440-39-3	0.0004	3.0E-01	1.35E+03	1.6E-01	2.1E+02	2.8E+00	3.8E+03	2.8E-01	3.8E+02	2.8E-01	3.8E+02	2.8E+00	3.8E+03	5.4E-02	5.2E+01	8.3E+01	8.3E+01	8.3E+01	1.0E-03				
Bis(2-ethylhexyl)phthalate	117-81-7	1	2.6E-03	2.58E-01	7.0E-02	1.8E-02	7.4E+00	1.9E+00	1.5E+01	3.9E+00	1.5E+01	3.9E+00	7.4E+00	1.9E+00	1.1E-01	4.4E+01	9.1E+01	9.1E+01	9.1E+01	2.6E-03				

Dose = (WI x Water Conc) + (FI x Sed Conc. X UFbenthics x 0.55) + (FI x Sed Conc. X Uffish x 0.25) + (FI x Sed Conc. X UF Aq Plant x 0.05) +(FI x Sed Conc. X Ufamphib x 0.1) + (FI x Sed Conc. X UF insect x 0.05)+(SI x Sed Conc.)/BW

East Ditch Marine (North Segment)
SLERA HQ Calculations
Less Conservative Analysis
EPC = 95% UCL
AUF = 1
NOAEL-based and LOAEL-based HQs

East Ditch Marine (North Segment)

Brine Service Company Superfund Site

Ingestion-Pathway Exposure Assumptions for Wildlife Measurement Receptors												
Common Name	Scientific Name	Feeding Behavior and Trophic Guild Representation	EMF	Body Weight (kg)		Food Ingestion Rate (kg/day DW)		Water Ingestion Rate (L/day)	Sediment Ingestion (% of diet)		Sediment Ingestion rate (kg/day)	
Birds												
Snowy Egret	<i>Egretta thula</i>	Invertevore/Carnivore	1	0.371	a	0.03050	b	0.03	b	7.3	d	0.0022
Mammals												
Raccoon	<i>Procyon lotor</i>	Omnivore	1	5.63	e	0.284	c	0.468	c	9.4	d	0.0267

Notes:

a To be conservative, the lower of the average male or female body weight was used if available (Dunning 1993).

b Food ingestion rates for birds determined using FI (kg/day) = 0.0582 Wt^{0.651} (kg) from USEPA 1993. Food ingestion rate for all birds.

Water ingestion rates for birds determined using WI (L/day) = 0.059 Wt^{0.67} (kg) from USEPA 1993. Water ingestion for all birds.

c Food ingestion rates for mammals determined using FI (kg/day) = 0.0687 Wt^{0.822} (kg) from USEPA 1993. Food ingestion rate for all mammals.

Water ingestion rates for birds determined using WI (L/day) = 0.099 Wt^{0.90} (kg) from USEPA 1993. Water ingestion for all mammals.

d Estimates of Soil Ingestion by Wildlife (Beyer, 1994). Soil/Sediment ingestion taken directly from Beyer (1994). Least sandpiper used as surrogate. Egrets do not forage as deep in sediment as sandpipers.

e Wildlife Exposure Factors Handbook (USEPA, 1993). Geometric mean of body weights for both sexes is used for raccoon.

East Ditch Marine (North Segment)

Brine Service Company Superfund Site

Common Name	Percent of Components in Receptor Diet		Benthic Invertebrates	Fish	Amphibians
	Aquatic Vascular	Aquatic Insects			
	Plants	Insects			
Birds					
Snowy Egret		5	20	70	5
Mammals					
Raccoon	5	5	55	25	10

East Ditch Marine (North Segment) - Less-Conservative Analysis

Brine Service Company Superfund Site

Location:	Northern Portion of East Ditch		
	Exposure Point Concentrations		
		Max Surface Water	95 % UCL
COCs	CAS No.	mg/L	mg/kg
Barium	7440-39-3	6.39E-01	2704
Bis(2-ethylhexyl)phthalate	117-81-7	1.10E-03	0.432
Endosulfan sulfate	1031-07-8	6.10E-06	0.023
High Molecular Weight PAHs	HPAH	4.97E-04	11.620
Lead	7439-92-1	2.38E-03	65.66
Selenium	7782-49-2	4.76E-03	0.844
Low Molecular Weight PAHs	LPAH	4.97E-04	2.026
Total PAHs	TPAH	4.97E-04	17.980

East Ditch Marine (North Segment) - Less-Conservative Analysis

Brine Service Company Superfund Site

Northern Portion of East Ditch											
Snowy Egret											
COC	EMF	CAS No.	Max Surface Water Conc (mg/L)	95% UCL Sediment Conc (mg/kg)	Benthic Invertebrate UF (unitless)	Benthic Invertebrate Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Total Daily Dose Rate (mg/kg BW-day)	NOAEL Toxicity Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
Barium	1	7440-39-3	6.4E-01	2.7E+03	2.8E+00	7.6E+03	2.8E-01	7.6E+02	1.9E+02	2.1E+01	9.2E+00
Barium	0.10	7440-39-3	6.4E-01	2.7E+03	2.8E+00	7.6E+03	2.8E-01	7.6E+02	1.9E+01	2.1E+01	9.2E-01
Bis(2-ethylhexyl)phthalate	1	117-81-7	1.1E-03	4.3E-01	7.4E+00	3.2E+00	1.5E+01	6.6E+00	4.9E-01	3.5E-01	1.4E+00
Bis(2-ethylhexyl)phthalate	0.10	117-81-7	1.1E-03	4.3E-01	7.4E+00	3.2E+00	1.5E+01	6.6E+00	4.9E-02	3.5E-01	1.4E-01
Endosulfan sulfate	1	1031-07-8	6.1E-06	2.3E-02	3.2E+01	7.4E-01	3.0E+04	6.9E+02	4.5E+01	6.5E-02	7.0E+02
Endosulfan sulfate	0.10	1031-07-8	6.1E-06	2.3E-02	3.2E+01	7.4E-01	3.0E+04	6.9E+02	4.5E+00	6.5E-02	7.0E+01
High Molecular Weight PAHs	1	HPAH	5.0E-04	1.2E+01	2.4E+00	2.7E+01	6.4E-02	7.5E-01	5.7E-01	2.0E+00	2.8E-01
Lead	1	7439-92-1	2.4E-03	6.6E+01	8.0E-02	5.3E+00	1.9E-01	1.2E+01	1.3E+00	1.6E+00	7.9E-01
Selenium	1	7782-49-2	4.8E-03	8.4E-01	3.7E+00	3.1E+00	4.8E+00	4.1E+00	3.2E-01	2.9E-01	1.1E+00
Selenium	0.10	7782-49-2	4.8E-03	8.4E-01	3.7E+00	3.1E+00	4.8E+00	4.1E+00	3.2E-02	2.9E-01	1.1E-01
Low Molecular Weight PAHs	1	LPAH	5.0E-04	2.0E+00	2.3E+00	4.6E+00	4.3E-01	8.7E-01	1.4E-01	1.7E+03	8.7E-05
Total PAHs	1	TPAH	5.0E-04	1.8E+01	2.3E+00	4.2E+01	2.0E-01	3.5E+00	1.0E+00	2.0E+00	5.1E-01

$$\text{Dose} = (\text{WI} \times \text{Water Conc}) + (\text{FI} \times \text{Sed Conc.} \times \text{UFbenthics} \times 0.20) + (\text{FI} \times \text{Sed Conc.} \times \text{Uffish} \times 0.80) + (\text{SI} \times \text{Sed Conc.})/\text{BW}$$

Note that the workplan states that diet consists of 5% of aquatic insects, 70% fish and 5% amphibians. These portions of diet are represented by sed conc. X fish UF.

Fish ingestion is considered to be 80% and benthic invertebrate proportion is assumed to be 20%.

Snowy egret is surrogate species for special status species and therefore only NOAEL evaluation is conducted.

East Ditch Marine (North Segment) - Less-Conservative Analysis
Brine Service Company Superfund Site

Northern Portion of East Ditch																	NOAEL	
Raccoon																	Toxicity Reference	
COC	EMF	CAS No.	Max Surface Water Conc (mg/L)	95% UCL Sediment Conc (mg/kg)	Aquatic Plant UF (unitless)	Aquatic Plant Conc (mg/kg)	Benthic		Aquatic Insect UF (unitless)	Aquatic Insect Conc (mg/kg)	Fish UF (unitless)	Fish Conc (mg/kg)	Amphibian UF (unitless)	Amphibian Conc (mg/kg)	Total Daily Dose (mg/kg BW-day)	Reference Value (mg/kg BW-day)	Reference Value (mg/kg BW-day)	NOAEL Hazard Quotient (unitless)
							Benthic Invertebrate	Invertebrate										
Barium	1	7440-39-3	6.4E-01	2.7E+03	1.6E-01	4.2E+02	2.8E+00	7.6E+03	2.8E-01	7.6E+02	2.8E-01	7.6E+02	2.8E+00	7.6E+03	2.7E+02	5.2E+01	8.3E+01	5.2E+00
Barium	0.0014	7440-39-3	6.4E-01	2.7E+03	1.6E-01	4.2E+02	2.8E+00	7.6E+03	2.8E-01	7.6E+02	2.8E-01	7.6E+02	2.8E+00	7.6E+03	3.8E-01	5.2E+01	8.3E+01	7.3E-03
Bis(2-ethylhexyl)phthalate	1	117-81-7	1.1E-03	4.3E-01	7.0E-02	3.0E-02	7.4E+00	3.2E+00	1.5E+01	6.6E+00	1.5E+01	6.6E+00	7.4E+00	3.2E+00	1.9E-01	4.4E+01	9.1E+01	4.3E-03
Endosulfan sulfate	1	1031-07-8	6.1E-06	2.3E-02	1.3E-02	2.9E-04	3.2E+01	7.4E-01	3.5E+04	8.1E+02	3.0E+04	6.9E+02	3.9E+00	9.0E-02	8.7E+00	4.0E+00	8.0E+00	2.2E+00
Endosulfan sulfate	0.0014	1031-07-8	6.1E-06	2.3E-02	1.3E-02	2.9E-04	3.2E+01	7.4E-01	3.5E+04	8.1E+02	3.0E+04	6.9E+02	3.9E+00	9.0E-02	1.2E-02	4.0E+00	8.0E+00	3.0E-03
High Molecular Weight PAHs	1	HPAH	5.0E-04	1.2E+01	3.4E-01	4.0E+00	2.4E+00	2.7E+01	6.4E-02	7.5E-01	6.4E-02	7.5E-01	2.4E+00	2.7E+01	9.7E-01	6.2E-01	3.1E+00	1.6E+00
High Molecular Weight PAHs	0.0014	HPAH	5.0E-04	1.2E+01	3.4E-01	4.0E+00	2.4E+00	2.7E+01	6.4E-02	7.5E-01	6.4E-02	7.5E-01	2.4E+00	2.7E+01	1.4E-03	6.2E-01	3.1E+00	2.2E-03
Lead	1	7439-92-1	2.4E-03	6.6E+01	2.7E-01	1.7E+01	8.0E-02	5.3E+00	1.9E-01	1.2E+01	1.9E-01	1.2E+01	8.0E-02	5.3E+00	6.8E-01	4.7E+00	8.9E+00	1.5E-01
Selenium	1	7782-49-2	4.8E-03	8.4E-01	6.7E-01	5.7E-01	3.7E+00	3.1E+00	4.8E+00	4.1E+00	4.8E+00	4.1E+00	3.7E+00	3.1E+00	1.6E-01	1.4E-01	2.2E-01	1.1E+00
Selenium	0.0014	7782-49-2	4.8E-03	8.4E-01	6.7E-01	5.7E-01	3.7E+00	3.1E+00	4.8E+00	4.1E+00	4.8E+00	4.1E+00	3.7E+00	3.1E+00	2.2E-04	1.4E-01	2.2E-01	1.6E-03
Low Molecular Weight PAHs	1	LPAH	5.0E-04	2.0E+00	4.6E+00	9.3E+00	2.3E+00	4.6E+00	4.3E-01	8.7E-01	4.3E-01	8.7E-01	2.3E+00	4.6E+00	1.9E-01	6.6E+01	3.3E+02	2.9E-03
Total PAHs	1	TPAH	5.0E-04	1.8E+01	2.2E+00	4.0E+01	2.3E+00	4.2E+01	2.0E-01	3.5E+00	2.0E-01	3.5E+00	2.3E+00	4.2E+01	1.6E+00	6.2E-01	3.1E+00	2.6E+00
Total PAHs	0.0014	TPAH	5.0E-04	1.8E+01	2.2E+00	4.0E+01	2.3E+00	4.2E+01	2.0E-01	3.5E+00	2.0E-01	3.5E+00	2.3E+00	4.2E+01	2.2E-03	6.2E-01	3.1E+00	3.6E-03

Dose = (WI x Water Conc) + (FI x Sed Conc. X UFbenthics x 0.55) + (FI x Sed Conc. X Uffish x 0.25) + (FI x Sed Conc. X UF Aq Plant x 0.05) +(FI x Sed Conc. X Ufamphib x 0.1) + (FI x Sed Conc. X UF insect x 0.05)+(SI x Sed Conc.)/BW

Appendix F – ProUCL Output

North Pit Terrestrial Exposure Area
Summary of 95% Upper Confidence Limits (UCLs) (mg/kg)
Brine Service Company Superfund Site

COPC	2017	95% UCL 0-2 feet bgs	2017	95% UCL 0-0.5 feet bgs	2017	95% UCL 1-2 feet bgs
Barium	1798	95% Chebyshev (Mean, SD) UCL	1717	95% H-UCL	835.1	95% Chebyshev (Mean, SD) UCL
Cadmium	17.03	95% H-UCL	6.141	95% H-UCL	23.14	95% Chebyshev (Mean, SD) UCL
Chromium	21.38	95% Chebyshev (Mean, SD) UCL	27.93	95% Adjusted Gamma UCL	7.707	95% Student's t-UCL
Copper	67.77	95% Chebyshev (Mean, SD) UCL	17.4	95% Adjusted Gamma UCL	112.9	95% Chebyshev (Mean, SD) UCL
Lead	273.7	95% Chebyshev (Mean, SD) UCL	181.9	95% H-UCL	240.4	95% Chebyshev (Mean, SD) UCL
Nickel	7.375	95% Approximate Gamma UCL	8.571	95% Student's t-UCL	6.717	95% Student's t-UCL
Zinc	1204	95% Approximate Gamma UCL	821.2	95% Student's t-UCL	3121	95% Chebyshev (Mean, SD) UCL
Mercury	21.96	95% H-UCL	2.26	95% H-UCL	13.15	95% Chebyshev (Mean, SD) UCL
Selenium	3.657	KM H-UCL	5.068	95% KM (Chebyshev) UCL	3.796	KM H-UCL
Cyanide	3.978	95% Approximate Gamma UCL	6.272	95% KM (t) UCL	2.3	Detection (1) in 29 samples
bis(2-Ethylhexyl) phthalate	8.519	95% KM (Chebyshev) UCL	10.27	95% KM (t) UCL	0.0129	KM H-UCL
High Molecular Weight PAHs	0.712	95% KM Approximate Gamma UCL	1.33	KM H-UCL	0.714	Gamma Adjusted KM-UCL

South Pit Terrestrial Exposure Area
Summary of 95% Upper Confidence Limits (UCLs) (mg/kg)
Brine Service Company Superfund Site

COPC	2017	95% UCL 0-2 feet bgs	2017	95% UCL 0-0.5 feet bgs	2017	95% UCL 1-2 feet bgs
Barium	888.4	95% Chebyshev (Mean, SD) UCL	576.4	95% H-UCL	1165	95% Chebyshev (Mean, SD) UCL
Cadmium	4.404	95% KM (Chebyshev) UCL	3.061	95% KM (Chebyshev) UCL	6.436	95% Chebyshev (Mean, SD) UCL
Chromium	60.56	95% Chebyshev (Mean, SD) UCL	40.85	95% Adjusted Gamma UCL	78.89	95% Chebyshev (Mean, SD) UCL
Copper	55.39	95% Chebyshev (Mean, SD) UCL	40.56	95% Chebyshev (Mean, SD) UCL	78.48	95% Chebyshev (Mean, SD) UCL
Lead	115.7	95% H-UCL	116	95% Adjusted Gamma UCL	127.9	95% H-UCL
Nickel	13.27	95% Chebyshev (Mean, SD) UCL	7.829	95% Student's-t UCL	17.63	95% Chebyshev (Mean, SD) UCL
Zinc	803.3	95% Chebyshev (Mean, SD) UCL	942.7	95% Adjusted Gamma UCL	817.4	95% Chebyshev (Mean, SD) UCL
Mercury	2.873	95% Chebyshev (Mean, SD) UCL	1.696	95% Chebyshev (Mean, SD) UCL	4.434	95% Chebyshev (Mean, SD) UCL
Selenium	1.103	95% KM Approximate Gamma UCL	0.911	95% KM (t) UCL	1.302	95% Adjusted Gamma UCL
4,4-DDT	0.0132	95% KM (t) UCL	0.00881	95% KM (t) UCL	0.019	95% KM (t) UCL
High Molecular Weight PAHs	2.827	KM H-UCL	0.476	95% Student's-t UCL	5.388	Gamma Adjusted KM-UCL

0 - 2 feet bgs Soil Analytical Data Summary North Area

Brine Service Company Superfund Site

Location	Depth	Barium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	D_Selenium	Zinc	Mercury	Cyanide	D_Cyanide	Aldrin	D_Aldrin	Endrin	D_Endrin	BEP	D_BEP	HMWPAH	D_HMWPAH
ENSS01	0-0.5 ft	6.68E+02	1.51E+01	2.56E+01	2.69E+01	5.92E+01	6.74E+00	4.61E-01	1	7.56E+02	8.97E-01	2.48E+00	1	1.70E-03	0	3.40E-03	0	1.10E-01	0	2.53E-01	1
ENSS02	0-0.5 ft	1.08E+03	1.76E+01	8.69E+00	1.38E+01	4.88E+01	2.97E+00	3.09E-01	1	8.90E+02	7.23E-02	1.07E+01	1	1.50E-03	0	3.00E-03	0	7.20E-02	0	2.10E-01	1
ENSS03	0-0.5 ft	1.16E+03	7.45E-01	8.26E+00	7.40E+00	3.77E+01	3.49E+00	4.21E-01	1	9.60E+02	2.53E-01	1.08E+01	1	1.60E-03	0	3.10E-03	0	1.20E-01	0	3.28E-01	1
ENSS04	0-0.5 ft	4.93E+02	2.35E-01	5.34E+00	5.82E+00	1.77E+01	4.44E+00	3.51E-01	1	9.68E+01	4.46E-02	3.94E+00	1	3.30E-04	0	6.60E-04	0	2.90E-02	0	1.76E-01	1
ENSS05	0-0.5 ft	1.61E+03	1.16E+00	8.64E+00	9.49E+00	4.50E+01	5.39E+00	4.84E-01	1	3.62E+02	4.49E-01	1.46E+01	1	1.60E-03	0	3.30E-03	0	8.70E-02	0	3.43E-01	1
ENSS06	0-0.5 ft	1.18E+04	7.02E-01	1.53E+01	1.30E+01	5.71E+01	6.20E+00	3.53E-01	1	3.96E+02	2.48E-01	6.10E-01	0	3.10E-03	0	6.20E-03	0	3.20E-01	0	2.16E-01	1
ENSS07	0-0.5 ft	9.79E+02	1.08E+00	5.71E+00	7.20E+00	1.24E+01	5.34E+00	7.52E+00	1	1.96E+02	9.73E-02	6.30E-01	0	1.60E-03	0	3.20E-03	0	7.10E-03	0	1.58E-02	0
ENSS08	0-0.5 ft	1.38E+03	1.56E+01	9.85E+00	9.08E+00	3.80E+01	5.70E+00	6.51E+00	1	3.56E+02	1.90E-01	3.43E+01	1	3.50E-04	0	6.90E-04	0	1.60E-01	0	1.72E-01	1
ENSS09	0-0.5 ft										4.04E-02										
ENSS10	0-0.5 ft										5.26E-01										
ENSS11	0-0.5 ft										5.80E-01										
ENSS11	0-0.5 ft										4.51E-01										
ESSH06	0-0.5 ft	6.36E+02	5.74E+00	3.71E+01	2.26E+01	1.38E+02	7.68E+00	4.96E+00	1	7.15E+02	8.97E+00	6.60E-01	0	3.40E-03	0	6.80E-03	0	7.50E-02	0	8.68E-01	1
ESSH07	0-0.5 ft	1.78E+02	9.23E-01	7.98E+00	5.69E+00	3.59E+01	2.38E+00	2.40E-01	0	2.43E+03	3.42E-02	2.88E+00	1	1.50E-03	0	3.00E-03	0	6.10E-02	0	2.38E-01	1
ESSH08	0-0.5 ft	3.32E+02	3.51E-01	4.01E+00	5.48E+00	1.29E+01	3.61E+00	3.93E-01	1	4.51E+01	2.40E-01	5.90E-01	0	1.60E-03	0	3.20E-03	0	1.20E-02	0	2.64E-01	1
NPSS01	0-0.5 ft	2.93E+02	1.27E+00	6.18E+01	1.43E+01	1.36E+02	1.23E+01	5.84E-01	1	1.03E+03	2.96E-01	6.20E-01	0	1.60E-03	0	3.20E-03	0	8.40E+01	1	1.18E+00	1
NPSS02	0-0.5 ft	3.70E+02	1.38E+00	1.90E+01	1.56E+01	6.36E+01	7.73E+00	2.80E+00	0	3.61E+02	1.66E+00	6.90E-01	0	3.50E-03	0	7.10E-03	0	1.70E-02	0	2.16E+00	1
NPSS03	0-0.5 ft	4.68E+02	7.38E+00	3.05E+01	2.72E+01	1.73E+02	6.10E+00	2.50E+00	1	9.62E+02	4.14E+00	6.70E-01	0	3.40E-04	0	4.40E-03	1	9.00E-02	1	1.59E+00	1
NPSS04	0-0.5 ft	3.59E+03	2.08E+00	1.30E+01	8.26E+00	5.35E+01	4.10E+00	2.40E+00	0	1.13E+03	3.40E-01	5.80E-01	0	1.50E-03	0	3.00E-03	0	3.20E-01	0	1.37E-01	1
NPSS05	0-0.5 ft	5.22E+02	9.47E+00	3.53E+01	3.45E+01	1.58E+02	6.48E+00	1.20E+01	1	8.88E+02	7.55E+00	6.40E-01	0	2.40E-02	1	6.10E-02	1	3.70E-02	0	2.58E+00	1
NPSS06	0-0.5 ft	1.42E+03	2.06E+00	1.92E+01	1.81E+01	3.70E+01	1.51E+01	2.70E+00	1	4.96E+02	4.35E-01	6.30E-01	0	3.40E-03	0	6.70E-03	0	7.40E-03	0	1.90E-01	1
NPSS07	0-0.5 ft	1.01E+03	5.60E+00	6.15E+01	2.59E+01	1.80E+03	1.20E+01	5.41E+00	1	1.13E+03	1.50E+00	6.90E-01	0	3.50E-03	0	6.90E-03	0	1.90E-01	0	1.17E+00	1
NPSS08	0-0.5 ft	3.27E+02	9.07E-01	8.16E+00	7.15E+00	1.01E+01	1.03E+01	2.60E+00	0	1.16E+02	1.25E-01	6.20E-01	0	3.30E-03	0	6.70E-03	0	3.70E-01	0	8.10E-01	1
NPSS08	0-0.5 ft	3.14E+02	7.43E-01	8.28E+00	5.84E+00	9.25E+00	8.35E+00	2.60E+00	0	1.11E+02	1.42E-01	6.20E-01	0	3.30E-03	0	6.70E-03	0	1.10E-01	0	3.78E-01	1
WSS05	0-0.5 ft	3.32E+02	2.33E+00	5.10E+01	2.18E+01	1.15E+02	1.16E+01	9.79E-01	1	8.87E+02	1.20E+00	9.41E-01	1	3.30E-04	0	6.60E-04	0	1.10E-02	1	5.12E-01	1
WSS06	0-0.5 ft	1.11E+03	3.56E-01	1.48E+01	6.73E+00	1.40E+01	8.29E+00	3.63E-01	1	6.81E+01	5.95E-02	6.60E-01	0	3.60E-04	0	7.10E-04	0	7.80E-02	0	1.74E+00	1
WSS07	0-0.5 ft	4.90E+02	3.57E+00	3.60E+01	1.87E+01	1.13E+02	1.54E+01	2.70E+00	1	7.94E+02	4.00E+00	7.15E-01	1	1.60E-03	0	3.10E-03	0	6.90E-03	0	8.33E-02	1
WSS08	0-0.5 ft	6.89E+02	1.29E+00	1.26E+01	1.08E+01	2.06E+01	7.72E+00	6.64E+00	1	2.59E+02	1.95E-01	6.40E-01	0	3.40E-03	0	6.90E-03	0	7.60E-02	0	5.28E-01	1
WSS10	0-0.5 ft										3.50E-01										
WSS11	0-0.5 ft										2.85E-01										
WSS11	0-0.5 ft										2.18E-01										
ENSB01	1-2 ft	1.88E+02	2.96E-01	5.40E+00	5.11E+00	1.09E+01	6.65E+00	1.12E+00	1	2.29E+01	9.90E-01	6.70E-01	0	3.60E-04	0	7.20E-04	0	7.90E-03	0	9.03E-01	1
ENSB02	1-2 ft	2.89E+02	1.59E-01	5.60E+00	5.05E+00	8.46E+00	5.74E+00	8.32E-01	1	1.70E+01	4.26E-02	7.10E-01	0	3.60E-04	0	7.30E-04	0	8.00E-03	0	1.78E-02	0
ENSB03	1-2 ft	1.00E+02	1.47E-01	5.08E																	

North Pit Soils 0 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L										
1					UCL Statistics for Uncensored Full Data Sets																	
2		User Selected Options	North Pit 0-2 feet																			
3		Date/Time of Computation	ProUCL 5.112/15/2017 8:27:09 AM																			
4		From File	171215 Summary Tables Soil Statistics.xlsx																			
5		Full Precision	OFF																			
6		Confidence Coefficient	95%																			
7		Number of Bootstrap Operations	2000																			

North Pit Soils 0 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
8	Barium																		
9	General Statistics																		
10	Total Number of Observations			54	Number of Distinct Observations			51											
11					Number of Missing Observations			16											
12	Minimum			100					Mean			816.3							
13	Maximum			11800					Median			332							
14	SD			1655					Std. Error of Mean			225.2							
15	Coefficient of Variation			2.027					Skewness			5.842							
16	Normal GOF Test																		
17	Shapiro Wilk Test Statistic			0.386	Shapiro Wilk GOF Test														
18	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
19	Lilliefors Test Statistic			0.333	Lilliefors GOF Test														
20	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
21	Data Not Normal at 5% Significance Level																		
22	Assuming Normal Distribution																		
23	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
24	95% Student's-t UCL			1193	95% Adjusted-CLT UCL (Chen-1995)			1378											
25					95% Modified-t UCL (Johnson-1978)			1223											
26	Gamma GOF Test																		
27	A-D Test Statistic			3.698	Anderson-Darling Gamma GOF Test														
28	5% A-D Critical Value			0.781	Data Not Gamma Distributed at 5% Significance Level														
29	K-S Test Statistic			0.195	Kolmogorov-Smirnov Gamma GOF Test														
30	5% K-S Critical Value			0.125	Data Not Gamma Distributed at 5% Significance Level														
31	Data Not Gamma Distributed at 5% Significance Level																		
32	Gamma Statistics																		
33	k hat (MLE)			0.982	k star (bias corrected MLE)			0.94											
34	Theta hat (MLE)			831	Theta star (bias corrected MLE)			868.3											
35	nu hat (MLE)			106.1	nu star (bias corrected)			101.5											
36	MLE Mean (bias corrected)			816.3	MLE Sd (bias corrected)			841.9											
37	Approximate Chi Square Value (0.05)																		
38	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			78.75											
39	Assuming Gamma Distribution																		
40	95% Approximate Gamma UCL (use when n>=50))			1045	95% Adjusted Gamma UCL (use when n<50)			1053											
41	Lognormal GOF Test																		
42	Shapiro Wilk Test Statistic			0.921	Shapiro Wilk Lognormal GOF Test														
43	5% Shapiro Wilk P Value			0.00156	Data Not Lognormal at 5% Significance Level														
44	Lilliefors Test Statistic			0.164	Lilliefors Lognormal GOF Test														
45	5% Lilliefors Critical Value			0.12	Data Not Lognormal at 5% Significance Level														
46	Data Not Lognormal at 5% Significance Level																		
47	Lognormal Statistics																		
48	Minimum of Logged Data			4.605	Mean of logged Data			6.116											
49	Maximum of Logged Data			9.376	SD of logged Data			0.911											
50	Assuming Lognormal Distribution																		
51	95% H-UCL			906.8	90% Chebyshev (MVUE) UCL			970.3											
52	95% Chebyshev (MVUE) UCL			1102	97.5% Chebyshev (MVUE) UCL			1285											
53	99% Chebyshev (MVUE) UCL			1645															
54	Nonparametric Distribution Free UCL Statistics																		
55	Data do not follow a Discernible Distribution (0.05)																		
56	Nonparametric Distribution Free UCLs																		
57	95% CLT UCL			1187	95% Jackknife UCL			1193											
58	95% Standard Bootstrap UCL			1179	95% Bootstrap-t UCL			1870											
59	95% Hall's Bootstrap UCL			2520	95% Percentile Bootstrap UCL			1227											
60	95% BCA Bootstrap UCL			1475															
61	90% Chebyshev(Mean, Sd) UCL			1492	95% Chebyshev(Mean, Sd) UCL			1798											
62	97.5% Chebyshev(Mean, Sd) UCL			2223	99% Chebyshev(Mean, Sd) UCL			3057											
63	Suggested UCL to Use																		
64	95% Chebyshev (Mean, Sd) UCL			1798															
65																			

North Pit Soils 0 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
66	Cadmium																		
67	General Statistics																		
68	Total Number of Observations			54	Number of Distinct Observations			54											
69					Number of Missing Observations			16											
70	Minimum			0.126					Mean			6.935							
71	Maximum			67.2					Median			1.33							
72	SD			12.57					Std. Error of Mean			1.711							
73	Coefficient of Variation			1.813					Skewness			2.877							
74	Normal GOF Test																		
75	Shapiro Wilk Test Statistic			0.601	Shapiro Wilk GOF Test														
76	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
77	Lilliefors Test Statistic			0.294	Lilliefors GOF Test														
78	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
79	Data Not Normal at 5% Significance Level																		
80	Assuming Normal Distribution																		
81	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
82	95% Student's-t UCL			9.799	95% Adjusted-CLT UCL (Chen-1995)			10.46											
83					95% Modified-t UCL (Johnson-1978)			9.911											
84	Gamma GOF Test																		
85	A-D Test Statistic			2.297	Anderson-Darling Gamma GOF Test														
86	5% A-D Critical Value			0.823	Data Not Gamma Distributed at 5% Significance Level														
87	K-S Test Statistic			0.181	Kolmogorov-Smirnov Gamma GOF Test														
88	5% K-S Critical Value			0.129	Data Not Gamma Distributed at 5% Significance Level														
89	Data Not Gamma Distributed at 5% Significance Level																		
90	Gamma Statistics																		
91	k hat (MLE)			0.468	k star (bias corrected MLE)			0.454											
92	Theta hat (MLE)			14.83	Theta star (bias corrected MLE)			15.28											
93	nu hat (MLE)			50.5	nu star (bias corrected)			49.03											
94	MLE Mean (bias corrected)			6.935	MLE Sd (bias corrected)			10.29											
95					Approximate Chi Square Value (0.05)			33.95											
96	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			33.61											
97	Assuming Gamma Distribution																		
98	95% Approximate Gamma UCL (use when n>=50))			10.01	95% Adjusted Gamma UCL (use when n<50)			10.12											
99	Lognormal GOF Test																		
100	Shapiro Wilk Test Statistic			0.941	Shapiro Wilk Lognormal GOF Test														
101	5% Shapiro Wilk P Value			0.0154	Data Not Lognormal at 5% Significance Level														
102	Lilliefors Test Statistic			0.0927	Lilliefors Lognormal GOF Test														
103	5% Lilliefors Critical Value			0.12	Data appear Lognormal at 5% Significance Level														
104	Data appear Approximate Lognormal at 5% Significance Level																		
105	Lognormal Statistics																		
106	Minimum of Logged Data			-2.071	Mean of logged Data			0.564											
107	Maximum of Logged Data			4.208	SD of logged Data			1.728											
108	Assuming Lognormal Distribution																		
109	95% H-UCL			17.03	90% Chebyshev (MVUE) UCL			14.58											
110	95% Chebyshev (MVUE) UCL			17.87	97.5% Chebyshev (MVUE) UCL			22.43											
111	99% Chebyshev (MVUE) UCL			31.39															
112	Nonparametric Distribution Free UCL Statistics																		
113	Data appear to follow a Discremable Distribution at 5% Significance Level																		
114	Nonparametric Distribution Free UCLs																		
115	95% CLT UCL			9.749	95% Jackknife UCL			9.799											
116	95% Standard Bootstrap UCL			9.736	95% Bootstrap-t UCL			10.84											
117	95% Hall's Bootstrap UCL			11.17	95% Percentile Bootstrap UCL			9.945											
118	95% BCA Bootstrap UCL			10.56															
119	90% Chebyshev(Mean, Sd) UCL			12.07	95% Chebyshev(Mean, Sd) UCL			14.39											
120	97.5% Chebyshev(Mean, Sd) UCL			17.62	99% Chebyshev(Mean, Sd) UCL			23.96											
121	Suggested UCL to Use																		
122	95% H-UCL			17.03															
123	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.																		
124	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.																		
125	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.																		
126	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.																		
127																			

North Pit Soils 0 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
128	Chromium																		
129	General Statistics																		
130	Total Number of Observations			54	Number of Distinct Observations			53											
131					Number of Missing Observations			16											
132	Minimum			2.67					Mean			13.25							
133	Maximum			61.8					Median			8.22							
134	SD			13.71					Std. Error of Mean			1.865							
135	Coefficient of Variation			1.035					Skewness			2.365							
136	Normal GOF Test																		
137	Shapiro Wilk Test Statistic			0.65	Shapiro Wilk GOF Test														
138	5% Shapiro Wilk P Value			9.992E-16	Data Not Normal at 5% Significance Level														
139	Lilliefors Test Statistic			0.294	Lilliefors GOF Test														
140	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
141	Data Not Normal at 5% Significance Level																		
142	Assuming Normal Distribution																		
143	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
144	95% Student's-t UCL			16.37	95% Adjusted-CLT UCL (Chen-1995)			16.96											
145					95% Modified-t UCL (Johnson-1978)			16.47											
146	Gamma GOF Test																		
147	A-D Test Statistic			3.572	Anderson-Darling Gamma GOF Test														
148	5% A-D Critical Value			0.766	Data Not Gamma Distributed at 5% Significance Level														
149	K-S Test Statistic			0.257	Kolmogorov-Smirnov Gamma GOF Test														
150	5% K-S Critical Value			0.123	Data Not Gamma Distributed at 5% Significance Level														
151	Data Not Gamma Distributed at 5% Significance Level																		
152	Gamma Statistics																		
153	k hat (MLE)			1.682	k star (bias corrected MLE)			1.601											
154	Theta hat (MLE)			7.878	Theta star (bias corrected MLE)			8.278											
155	nu hat (MLE)			181.6	nu star (bias corrected)			172.9											
156	MLE Mean (bias corrected)			13.25	MLE Sd (bias corrected)			10.47											
157	Approximate Chi Square Value (0.05)																		
158	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			142.7											
159	Assuming Gamma Distribution																		
160	95% Approximate Gamma UCL (use when n>=50))			15.96	95% Adjusted Gamma UCL (use when n<50)			16.05											
161	Lognormal GOF Test																		
162	Shapiro Wilk Test Statistic			0.904	Shapiro Wilk Lognormal GOF Test														
163	5% Shapiro Wilk P Value			2.0153E-4	Data Not Lognormal at 5% Significance Level														
164	Lilliefors Test Statistic			0.211	Lilliefors Lognormal GOF Test														
165	5% Lilliefors Critical Value			0.12	Data Not Lognormal at 5% Significance Level														
166	Data Not Lognormal at 5% Significance Level																		
167	Lognormal Statistics																		
168	Minimum of Logged Data			0.982	Mean of logged Data			2.258											
169	Maximum of Logged Data			4.124	SD of logged Data			0.739											
170	Assuming Lognormal Distribution																		
171	95% H-UCL			15.5	90% Chebyshev (MVUE) UCL			16.66											
172	95% Chebyshev (MVUE) UCL			18.54	97.5% Chebyshev (MVUE) UCL			21.16											
173	99% Chebyshev (MVUE) UCL			26.31															
174	Nonparametric Distribution Free UCL Statistics																		
175	Data do not follow a Discernible Distribution (0.05)																		
176	Nonparametric Distribution Free UCLs																		
177	95% CLT UCL			16.32	95% Jackknife UCL			16.37											
178	95% Standard Bootstrap UCL			16.34	95% Bootstrap-t UCL			17.53											
179	95% Hall's Bootstrap UCL			16.77	95% Percentile Bootstrap UCL			16.56											
180	95% BCA Bootstrap UCL			16.8															
181	90% Chebyshev(Mean, Sd) UCL			18.84	95% Chebyshev(Mean, Sd) UCL			21.38											
182	97.5% Chebyshev(Mean, Sd) UCL			24.9	99% Chebyshev(Mean, Sd) UCL			31.81											
183	Suggested UCL to Use																		
184	95% Chebyshev (Mean, Sd) UCL			21.38															
185																			

North Pit Soils 0 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
186	Copper																		
187	General Statistics																		
188	Total Number of Observations			54	Number of Distinct Observations			53											
189					Number of Missing Observations			16											
190	Minimum			3.13					Mean			28.66							
191	Maximum			475					Median			11.1							
192	SD			65.93					Std. Error of Mean			8.972							
193	Coefficient of Variation			2.3					Skewness			6.119							
194	Normal GOF Test																		
195	Shapiro Wilk Test Statistic			0.363	Shapiro Wilk GOF Test														
196	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
197	Lilliefors Test Statistic			0.349	Lilliefors GOF Test														
198	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
199	Data Not Normal at 5% Significance Level																		
200	Assuming Normal Distribution																		
201	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
202	95% Student's-t UCL			43.68	95% Adjusted-CLT UCL (Chen-1995)			51.41											
203					95% Modified-t UCL (Johnson-1978)			44.93											
204	Gamma GOF Test																		
205	A-D Test Statistic			3.913	Anderson-Darling Gamma GOF Test														
206	5% A-D Critical Value			0.789	Data Not Gamma Distributed at 5% Significance Level														
207	K-S Test Statistic			0.195	Kolmogorov-Smirnov Gamma GOF Test														
208	5% K-S Critical Value			0.126	Data Not Gamma Distributed at 5% Significance Level														
209	Data Not Gamma Distributed at 5% Significance Level																		
210	Gamma Statistics																		
211	k hat (MLE)			0.819	k star (bias corrected MLE)			0.786											
212	Theta hat (MLE)			34.98	Theta star (bias corrected MLE)			36.45											
213	nu hat (MLE)			88.51	nu star (bias corrected)			84.92											
214	MLE Mean (bias corrected)			28.66	MLE Sd (bias corrected)			32.33											
215	Approximate Chi Square Value (0.05)																		
216	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			64.2											
217	Assuming Gamma Distribution																		
218	95% Approximate Gamma UCL (use when n>=50))			37.63	95% Adjusted Gamma UCL (use when n<50)			37.92											
219	Lognormal GOF Test																		
220	Shapiro Wilk Test Statistic			0.911	Shapiro Wilk Lognormal GOF Test														
221	5% Shapiro Wilk P Value			4.4414E-4	Data Not Lognormal at 5% Significance Level														
222	Lilliefors Test Statistic			0.142	Lilliefors Lognormal GOF Test														
223	5% Lilliefors Critical Value			0.12	Data Not Lognormal at 5% Significance Level														
224	Data Not Lognormal at 5% Significance Level																		
225	Lognormal Statistics																		
226	Minimum of Logged Data			1.141	Mean of logged Data			2.634											
227	Maximum of Logged Data			6.163	SD of logged Data			1.006											
228	Assuming Lognormal Distribution																		
229	95% H-UCL			31.88	90% Chebyshev (MVUE) UCL			33.85											
230	95% Chebyshev (MVUE) UCL			38.86	97.5% Chebyshev (MVUE) UCL			45.81											
231	99% Chebyshev (MVUE) UCL			59.47															
232	Nonparametric Distribution Free UCL Statistics																		
233	Data do not follow a Discernible Distribution (0.05)																		
234	Nonparametric Distribution Free UCLs																		
235	95% CLT UCL			43.42	95% Jackknife UCL			43.68											
236	95% Standard Bootstrap UCL			43.28	95% Bootstrap-t UCL			69.79											
237	95% Hall's Bootstrap UCL			96.29	95% Percentile Bootstrap UCL			45.7											
238	95% BCA Bootstrap UCL			55.04															
239	90% Chebyshev(Mean, Sd) UCL			55.58	95% Chebyshev(Mean, Sd) UCL			67.77											
240	97.5% Chebyshev(Mean, Sd) UCL			84.7	99% Chebyshev(Mean, Sd) UCL			117.9											
241	Suggested UCL to Use																		
242	95% Chebyshev (Mean, Sd) UCL			67.77															
243																			

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	A	B	C	D	E	F	G	H	I	J	K	L
244						Lead						
245						General Statistics						
246				Total Number of Observations	54			Number of Distinct Observations	53			
247								Number of Missing Observations	16			
248				Minimum	7.02			Mean	115.1			
249				Maximum	1800			Median	46.9			
250				SD	267.3			Std. Error of Mean	36.38			
251				Coefficient of Variation	2.322			Skewness	5.32			
252				Normal GOF Test								
253				Shapiro Wilk Test Statistic	0.4		Shapiro Wilk GOF Test					
254				5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level				
255				Lilliefors Test Statistic	0.343		Lilliefors GOF Test					
256				5% Lilliefors Critical Value	0.12			Data Not Normal at 5% Significance Level				
257				Data Not Normal at 5% Significance Level								
258				Assuming Normal Distribution								
259				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
260				95% Student's-t UCL	176		95% Adjusted-CLT UCL (Chen-1995)	203.1				
261							95% Modified-t UCL (Johnson-1978)	180.4				
262				Gamma GOF Test								
263				A-D Test Statistic	2.517		Anderson-Darling Gamma GOF Test					
264				5% A-D Critical Value	0.803			Data Not Gamma Distributed at 5% Significance Level				
265				K-S Test Statistic	0.164		Kolmogorov-Smirnov Gamma GOF Test					
266				5% K-S Critical Value	0.127			Data Not Gamma Distributed at 5% Significance Level				
267				Data Not Gamma Distributed at 5% Significance Level								
268				Gamma Statistics								
269				k hat (MLE)	0.634		k star (bias corrected MLE)	0.611				
270				Theta hat (MLE)	181.5		Theta star (bias corrected MLE)	188.3				
271				nu hat (MLE)	68.5		nu star (bias corrected)	66.02				
272				MLE Mean (bias corrected)	115.1		MLE Sd (bias corrected)	147.2				
273							Approximate Chi Square Value (0.05)	48.33				
274				Adjusted Level of Significance	0.0456		Adjusted Chi Square Value	47.91				
275				Assuming Gamma Distribution								
276				95% Approximate Gamma UCL (use when n>=50))	157.3		95% Adjusted Gamma UCL (use when n<50)	158.6				
277				Lognormal GOF Test								
278				Shapiro Wilk Test Statistic	0.934		Shapiro Wilk Lognormal GOF Test					
279				5% Shapiro Wilk P Value	0.00755			Data Not Lognormal at 5% Significance Level				
280				Lilliefors Test Statistic	0.122		Lilliefors Lognormal GOF Test					
281				5% Lilliefors Critical Value	0.12			Data Not Lognormal at 5% Significance Level				
282				Data Not Lognormal at 5% Significance Level								
283				Lognormal Statistics								
284				Minimum of Logged Data	1.949		Mean of logged Data	3.78				
285				Maximum of Logged Data	7.496		SD of logged Data	1.288				
286				Assuming Lognormal Distribution								
287				95% H-UCL	162.6		90% Chebyshev (MVUE) UCL	163				
288				95% Chebyshev (MVUE) UCL	192.6		97.5% Chebyshev (MVUE) UCL	233.6				
289				99% Chebyshev (MVUE) UCL	314.2							
290				Nonparametric Distribution Free UCL Statistics								
291				Data do not follow a Discernible Distribution (0.05)								
292				Nonparametric Distribution Free UCLs								
293				95% CLT UCL	175		95% Jackknife UCL	176				
294				95% Standard Bootstrap UCL	173.8		95% Bootstrap-t UCL	309.8				
295				95% Hall's Bootstrap UCL	429.8		95% Percentile Bootstrap UCL	181				
296				95% BCA Bootstrap UCL	214							
297				90% Chebyshev(Mean, Sd) UCL	224.2		95% Chebyshev(Mean, Sd) UCL	273.7				
298				97.5% Chebyshev(Mean, Sd) UCL	342.3		99% Chebyshev(Mean, Sd) UCL	477.1				
299				Suggested UCL to Use								
300				95% Chebyshev (Mean, Sd) UCL	273.7							
301												

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	A	B	C	D	E	F	G	H	I	J	K	L							
Nickel																			
General Statistics																			
304	Total Number of Observations			54	Number of Distinct Observations			51											
305					Number of Missing Observations			16											
306	Minimum			2.38					Mean			6.725							
307	Maximum			15.4					Median			6.5							
308	SD			2.777					Std. Error of Mean			0.378							
309	Coefficient of Variation			0.413					Skewness			1.244							
310	Normal GOF Test																		
311	Shapiro Wilk Test Statistic			0.89	Shapiro Wilk GOF Test														
312	5% Shapiro Wilk P Value			4.0181E-5	Data Not Normal at 5% Significance Level														
313	Lilliefors Test Statistic			0.164	Lilliefors GOF Test														
314	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
315	Data Not Normal at 5% Significance Level																		
316	Assuming Normal Distribution																		
317	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
318	95% Student's-t UCL			7.358	95% Adjusted-CLT UCL (Chen-1995)			7.415											
319					95% Modified-t UCL (Johnson-1978)			7.368											
320	Gamma GOF Test																		
321	A-D Test Statistic			0.978	Anderson-Darling Gamma GOF Test														
322	5% A-D Critical Value			0.753	Data Not Gamma Distributed at 5% Significance Level														
323	K-S Test Statistic			0.115	Kolmogorov-Smirnov Gamma GOF Test														
324	5% K-S Critical Value			0.121	Detected data appear Gamma Distributed at 5% Significance Level														
325	Detected data follow Appr. Gamma Distribution at 5% Significance Level																		
326	Gamma Statistics																		
327	k hat (MLE)			6.56	k star (bias corrected MLE)			6.208											
328	Theta hat (MLE)			1.025	Theta star (bias corrected MLE)			1.083											
329	nu hat (MLE)			708.5	nu star (bias corrected)			670.5											
330	MLE Mean (bias corrected)			6.725	MLE Sd (bias corrected)			2.699											
331	Approximate Chi Square Value (0.05)																		
332	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			609.8											
333	Assuming Gamma Distribution																		
334	95% Approximate Gamma UCL (use when n>=50)			7.375	95% Adjusted Gamma UCL (use when n<50)			7.393											
335	Lognormal GOF Test																		
336	Shapiro Wilk Test Statistic			0.959	Shapiro Wilk Lognormal GOF Test														
337	5% Shapiro Wilk P Value			0.12	Data appear Lognormal at 5% Significance Level														
338	Lilliefors Test Statistic			0.132	Lilliefors Lognormal GOF Test														
339	5% Lilliefors Critical Value			0.12	Data Not Lognormal at 5% Significance Level														
340	Data appear Approximate Lognormal at 5% Significance Level																		
341	Lognormal Statistics																		
342	Minimum of Logged Data			0.867	Mean of logged Data			1.828											
343	Maximum of Logged Data			2.734	SD of logged Data			0.401											
344	Assuming Lognormal Distribution																		
345	95% H-UCL			7.448	90% Chebyshev (MVUE) UCL			7.866											
346	95% Chebyshev (MVUE) UCL			8.381	97.5% Chebyshev (MVUE) UCL			9.096											
347	99% Chebyshev (MVUE) UCL			10.5															
348	Nonparametric Distribution Free UCL Statistics																		
349	Data appear to follow a Discernible Distribution at 5% Significance Level																		
350	Nonparametric Distribution Free UCLs																		
351	95% CLT UCL			7.347	95% Jackknife UCL			7.358											
352	95% Standard Bootstrap UCL			7.358	95% Bootstrap-t UCL			7.457											
353	95% Hall's Bootstrap UCL			7.461	95% Percentile Bootstrap UCL			7.349											
354	95% BCA Bootstrap UCL			7.45															
355	90% Chebyshev(Mean, Sd) UCL			7.859	95% Chebyshev(Mean, Sd) UCL			8.372											
356	97.5% Chebyshev(Mean, Sd) UCL			9.085	99% Chebyshev(Mean, Sd) UCL			10.48											
357	Suggested UCL to Use																		
358	95% Approximate Gamma UCL			7.375															
359																			

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	A	B	C	D	E	F	G	H	I	J	K	L							
360	Zinc																		
361	General Statistics																		
362	Total Number of Observations			54	Number of Distinct Observations			53											
363					Number of Missing Observations			16											
364	Minimum			10.9					Mean										
365	Maximum			13700					Median										
366	SD			1903					Std. Error of Mean										
367	Coefficient of Variation			2.208					Skewness										
368	Normal GOF Test																		
369	Shapiro Wilk Test Statistic			0.406	Shapiro Wilk GOF Test														
370	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
371	Lilliefors Test Statistic			0.327	Lilliefors GOF Test														
372	5% Lilliefors Critical Value			0.12	Data Not Normal at 5% Significance Level														
373	Data Not Normal at 5% Significance Level																		
374	Assuming Normal Distribution																		
375	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
376	95% Student's-t UCL			1296	95% Adjusted-CLT UCL (Chen-1995)			1515											
377					95% Modified-t UCL (Johnson-1978)			1331											
378	Gamma GOF Test																		
379	A-D Test Statistic			0.971	Anderson-Darling Gamma GOF Test														
380	5% A-D Critical Value			0.81	Data Not Gamma Distributed at 5% Significance Level														
381	K-S Test Statistic			0.108	Kolmogorov-Smirnov Gamma GOF Test														
382	5% K-S Critical Value			0.128	Detected data appear Gamma Distributed at 5% Significance Level														
383	Detected data follow Appr. Gamma Distribution at 5% Significance Level																		
384	Gamma Statistics																		
385	k hat (MLE)			0.557	k star (bias corrected MLE)			0.539											
386	Theta hat (MLE)			1546	Theta star (bias corrected MLE)			1600											
387	nu hat (MLE)			60.2	nu star (bias corrected)			58.19											
388	MLE Mean (bias corrected)			862	MLE Sd (bias corrected)			1174											
389	Approximate Chi Square Value (0.05)																		
390	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			41.27											
391	Assuming Gamma Distribution																		
392	95% Approximate Gamma UCL (use when n>=50)			1204	95% Adjusted Gamma UCL (use when n<50)			1215											
393	Lognormal GOF Test																		
394	Shapiro Wilk Test Statistic			0.95	Shapiro Wilk Lognormal GOF Test														
395	5% Shapiro Wilk P Value			0.0468	Data Not Lognormal at 5% Significance Level														
396	Lilliefors Test Statistic			0.132	Lilliefors Lognormal GOF Test														
397	5% Lilliefors Critical Value			0.12	Data Not Lognormal at 5% Significance Level														
398	Data Not Lognormal at 5% Significance Level																		
399	Lognormal Statistics																		
400	Minimum of Logged Data			2.389	Mean of logged Data			5.638											
401	Maximum of Logged Data			9.525	SD of logged Data			1.636											
402	Assuming Lognormal Distribution																		
403	95% H-UCL			2180	90% Chebyshev (MVUE) UCL			1948											
404	95% Chebyshev (MVUE) UCL			2371	97.5% Chebyshev (MVUE) UCL			2957											
405	99% Chebyshev (MVUE) UCL			4110															
406	Nonparametric Distribution Free UCL Statistics																		
407	Data appear to follow a Discernible Distribution at 5% Significance Level																		
408	Nonparametric Distribution Free UCLs																		
409	95% CLT UCL			1288	95% Jackknife UCL			1296											
410	95% Standard Bootstrap UCL			1283	95% Bootstrap-t UCL			2005											
411	95% Hall's Bootstrap UCL			2928	95% Percentile Bootstrap UCL			1350											
412	95% BCA Bootstrap UCL			1561															
413	90% Chebyshev(Mean, Sd) UCL			1639	95% Chebyshev(Mean, Sd) UCL			1991											
414	97.5% Chebyshev(Mean, Sd) UCL			2479	99% Chebyshev(Mean, Sd) UCL			3439											
415	Suggested UCL to Use																		
416	95% Approximate Gamma UCL			1204															
417																			

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	A	B	C	D	E	F	G	H	I	J	K	L							
418	Mercury																		
419	General Statistics																		
420	Total Number of Observations			72	Number of Distinct Observations			70											
421					Number of Missing Observations			0											
422	Minimum			0.00226					Mean										
423	Maximum			58.1					Median										
424	SD			8.719					Std. Error of Mean										
425	Coefficient of Variation			2.493					Skewness										
426	Normal GOF Test																		
427	Shapiro Wilk Test Statistic			0.468	Shapiro Wilk GOF Test														
428	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
429	Lilliefors Test Statistic			0.344	Lilliefors GOF Test														
430	5% Lilliefors Critical Value			0.104	Data Not Normal at 5% Significance Level														
431	Data Not Normal at 5% Significance Level																		
432	Assuming Normal Distribution																		
433	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
434	95% Student's-t UCL			5.21	95% Adjusted-CLT UCL (Chen-1995)			5.75											
435					95% Modified-t UCL (Johnson-1978)			5.298											
436	Gamma GOF Test																		
437	A-D Test Statistic			3.231	Anderson-Darling Gamma GOF Test														
438	5% A-D Critical Value			0.872	Data Not Gamma Distributed at 5% Significance Level														
439	K-S Test Statistic			0.204	Kolmogorov-Smirnov Gamma GOF Test														
440	5% K-S Critical Value			0.115	Data Not Gamma Distributed at 5% Significance Level														
441	Data Not Gamma Distributed at 5% Significance Level																		
442	Gamma Statistics																		
443	k hat (MLE)			0.286	k star (bias corrected MLE)			0.283											
444	Theta hat (MLE)			12.22	Theta star (bias corrected MLE)			12.34											
445	nu hat (MLE)			41.2	nu star (bias corrected)			40.82											
446	MLE Mean (bias corrected)			3.498	MLE Sd (bias corrected)			6.569											
447					Approximate Chi Square Value (0.05)			27.17											
448	Adjusted Level of Significance			0.0467	Adjusted Chi Square Value			26.95											
449	Assuming Gamma Distribution																		
450	95% Approximate Gamma UCL (use when n>=50))			5.253	95% Adjusted Gamma UCL (use when n<50)			5.297											
451	Lognormal GOF Test																		
452	Shapiro Wilk Test Statistic			0.962	Shapiro Wilk Lognormal GOF Test														
453	5% Shapiro Wilk P Value			0.0832	Data appear Lognormal at 5% Significance Level														
454	Lilliefors Test Statistic			0.0976	Lilliefors Lognormal GOF Test														
455	5% Lilliefors Critical Value			0.104	Data appear Lognormal at 5% Significance Level														
456	Data appear Lognormal at 5% Significance Level																		
457	Lognormal Statistics																		
458	Minimum of Logged Data			-6.092	Mean of logged Data			-1.177											
459	Maximum of Logged Data			4.062	SD of logged Data			2.481											
460	Assuming Lognormal Distribution																		
461	95% H-UCL			21.96	90% Chebyshev (MVUE) UCL			14											
462	95% Chebyshev (MVUE) UCL			17.76	97.5% Chebyshev (MVUE) UCL			22.97											
463	99% Chebyshev (MVUE) UCL			33.2															
464	Nonparametric Distribution Free UCL Statistics																		
465	Data appear to follow a Discremable Distribution at 5% Significance Level																		
466	Nonparametric Distribution Free UCLs																		
467	95% CLT UCL			5.188	95% Jackknife UCL			5.21											
468	95% Standard Bootstrap UCL			5.214	95% Bootstrap-t UCL			6.626											
469	95% Hall's Bootstrap UCL			7.539	95% Percentile Bootstrap UCL			5.25											
470	95% BCA Bootstrap UCL			5.73															
471	90% Chebyshev(Mean, Sd) UCL			6.58	95% Chebyshev(Mean, Sd) UCL			7.977											
472	97.5% Chebyshev(Mean, Sd) UCL			9.915	99% Chebyshev(Mean, Sd) UCL			13.72											
473	Suggested UCL to Use																		
474	95% H-UCL			21.96															
475	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.																		
476	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.																		
477	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.																		
478	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.																		
479																			

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	A	B	C	D	E	F	G	H	I	J	K	L										
480					UCL Statistics for Data Sets with Non-Detects																	
481		User Selected Options	North Pit 0 - 2 feet Nondetects																			
482		Date/Time of Computation	ProUCL 5.112/15/2017 8:31:09 AM																			
483		From File	171215 Summary Tables Soil Statistics.xls																			
484		Full Precision	OFF																			
485		Confidence Coefficient	95%																			
486		Number of Bootstrap Operations	2000																			
487																						

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	A	B	C	D	E	F	G	H	I	J	K	L						
488						Selenium												
489						General Statistics												
490				Total Number of Observations	54			Number of Distinct Observations	52									
491								Number of Missing Observations	16									
492				Number of Detects	47			Number of Non-Detects	7									
493				Number of Distinct Detects	46			Number of Distinct Non-Detects	6									
494				Minimum Detect	0.309			Minimum Non-Detect	0.24									
495				Maximum Detect	12.8			Maximum Non-Detect	2.8									
496				Variance Detects	9			Percent Non-Detects	12.96%									
497				Mean Detects	2.787			SD Detects	3									
498				Median Detects	1.36			CV Detects	1.076									
499				Skewness Detects	1.733			Kurtosis Detects	2.927									
500				Mean of Logged Detects	0.482			SD of Logged Detects	1.078									
501				Normal GOF Test on Detects Only														
502				Shapiro Wilk Test Statistic	0.78			Shapiro Wilk GOF Test										
503				5% Shapiro Wilk Critical Value	0.946			Detected Data Not Normal at 5% Significance Level										
504				Lilliefors Test Statistic	0.223			Lilliefors GOF Test										
505				5% Lilliefors Critical Value	0.128			Detected Data Not Normal at 5% Significance Level										
506				Detected Data Not Normal at 5% Significance Level														
507				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs														
508				KM Mean	2.513			KM Standard Error of Mean	0.395									
509				KM SD	2.865			95% KM (BCA) UCL	3.23									
510				95% KM (t) UCL	3.174			95% KM (Percentile Bootstrap) UCL	3.158									
511				95% KM (z) UCL	3.162			95% KM Bootstrap t UCL	3.284									
512				90% KM Chebyshev UCL	3.697			95% KM Chebyshev UCL	4.234									
513				97.5% KM Chebyshev UCL	4.978			99% KM Chebyshev UCL	6.441									
514				Gamma GOF Tests on Detected Observations Only														
515				A-D Test Statistic	1.06			Anderson-Darling GOF Test										
516				5% A-D Critical Value	0.777			Detected Data Not Gamma Distributed at 5% Significance Level										
517				K-S Test Statistic	0.153			Kolmogorov-Smirnov GOF										
518				5% K-S Critical Value	0.133			Detected Data Not Gamma Distributed at 5% Significance Level										
519				Detected Data Not Gamma Distributed at 5% Significance Level														
520				Gamma Statistics on Detected Data Only														
521				k hat (MLE)	1.057			k star (bias corrected MLE)	1.004									
522				Theta hat (MLE)	2.636			Theta star (bias corrected MLE)	2.776									
523				nu hat (MLE)	99.37			nu star (bias corrected)	94.36									
524				Mean (detects)	2.787													
525				Gamma ROS Statistics using Imputed Non-Detects														
526				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs														
527				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)														
528				For such situations, GROS method may yield incorrect values of UCLs and BTVs														
529				This is especially true when the sample size is small.														
530				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates														
531				Minimum	0.01			Mean	2.481									
532				Maximum	12.8			Median	1.151									
533				SD	2.911			CV	1.173									
534				k hat (MLE)	0.812			k star (bias corrected MLE)	0.779									
535				Theta hat (MLE)	3.057			Theta star (bias corrected MLE)	3.185									
536				nu hat (MLE)	87.66			nu star (bias corrected)	84.12									
537				Adjusted Level of Significance (β)	0.0456													
538				Approximate Chi Square Value (84.12, α)	63.98			Adjusted Chi Square Value (84.12, β)	63.5									
539				95% Gamma Approximate UCL (use when n>=50)	3.262			95% Gamma Adjusted UCL (use when n<50)	3.287									
540				Estimates of Gamma Parameters using KM Estimates														
541				Mean (KM)	2.513			SD (KM)	2.865									
542				Variance (KM)	8.207			SE of Mean (KM)	0.395									
543				k hat (KM)	0.769			k star (KM)	0.739									
544				nu hat (KM)	83.09			nu star (KM)	79.81									
545				theta hat (KM)	3.266			theta star (KM)	3.401									
546				80% gamma percentile (KM)	4.122			90% gamma percentile (KM)	6.227									
547				95% gamma percentile (KM)	8.388			99% gamma percentile (KM)	13.52									
548				Gamma Kaplan-Meier (KM) Statistics														
549				Approximate Chi Square Value (79.81, α)	60.22			Adjusted Chi Square Value (79.81, β)	59.76									

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	A	B	C	D	E	F	G	H	I	J	K	L						
550		95% Gamma Approximate KM-UCL (use when n>=50)			3.33		95% Gamma Adjusted KM-UCL (use when n<50)			3.356								
Lognormal GOF Test on Detected Observations Only																		
552		Shapiro Wilk Test Statistic		0.938			Shapiro Wilk GOF Test											
553		5% Shapiro Wilk Critical Value		0.946			Detected Data Not Lognormal at 5% Significance Level											
554		Lilliefors Test Statistic		0.0891			Lilliefors GOF Test											
555		5% Lilliefors Critical Value		0.128			Detected Data appear Lognormal at 5% Significance Level											
556	Detected Data appear Approximate Lognormal at 5% Significance Level																	
557	Lognormal ROS Statistics Using Imputed Non-Detects																	
558		Mean in Original Scale		2.505				Mean in Log Scale		0.326								
559		SD in Original Scale		2.893				SD in Log Scale		1.122								
560		95% t UCL (assumes normality of ROS data)		3.164				95% Percentile Bootstrap UCL		3.181								
561		95% BCA Bootstrap UCL		3.265				95% Bootstrap t UCL		3.321								
562		95% H-UCL (Log ROS)		3.811														
563	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																	
564		KM Mean (logged)		0.337				KM Geo Mean		1.401								
565		KM SD (logged)		1.09				95% Critical H Value (KM-Log)		2.435								
566		KM Standard Error of Mean (logged)		0.152				95% H-UCL (KM -Log)		3.657								
567		KM SD (logged)		1.09				95% Critical H Value (KM-Log)		2.435								
568		KM Standard Error of Mean (logged)		0.152														
569	DL/2 Statistics																	
570	DL/2 Normal				DL/2 Log-Transformed													
571		Mean in Original Scale		2.54				Mean in Log Scale		0.36								
572		SD in Original Scale		2.875				SD in Log Scale		1.11								
573		95% t UCL (Assumes normality)		3.195				95% H-Stat UCL		3.864								
574	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
575	Nonparametric Distribution Free UCL Statistics																	
576	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level																	
577	Suggested UCL to Use																	
578		KM H-UCL		3.657														
579																		

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	A	B	C	D	E	F	G	H	I	J	K	L
580	Cyanide											
581	General Statistics											
582												
583	Total Number of Observations	54										Number of Distinct Observations 25
584												Number of Missing Observations 16
585	Number of Detects	10										Number of Non-Detects 44
586	Number of Distinct Detects	10										Number of Distinct Non-Detects 15
587	Minimum Detect	0.715										Minimum Non-Detect 0.58
588	Maximum Detect	34.3										Maximum Non-Detect 0.73
589	Variance Detects	106.4										Percent Non-Detects 81.48%
590	Mean Detects	8.366										SD Detects 10.32
591	Median Detects	3.41										CV Detects 1.233
592	Skewness Detects	2.047										Kurtosis Detects 4.611
593	Mean of Logged Detects	1.474										SD of Logged Detects 1.242
594	Normal GOF Test on Detects Only											
595	Shapiro Wilk Test Statistic	0.741										Shapiro Wilk GOF Test
596	5% Shapiro Wilk Critical Value	0.842										Detected Data Not Normal at 5% Significance Level
597	Lilliefors Test Statistic	0.266										Lilliefors GOF Test
598	5% Lilliefors Critical Value	0.262										Detected Data Not Normal at 5% Significance Level
599	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
600	KM Mean	2.022										KM Standard Error of Mean 0.744
601	KM SD	5.184										95% KM (BCA) UCL 3.436
602	95% KM (t) UCL	3.267										95% KM (Percentile Bootstrap) UCL 3.323
603	95% KM (z) UCL	3.245										95% KM Bootstrap t UCL 4.756
604	90% KM Chebyshev UCL	4.253										95% KM Chebyshev UCL 5.264
605	97.5% KM Chebyshev UCL	6.666										99% KM Chebyshev UCL 9.422
606	Gamma GOF Tests on Detected Observations Only											
607	A-D Test Statistic	0.382										Anderson-Darling GOF Test
608	5% A-D Critical Value	0.752										Detected data appear Gamma Distributed at 5% Significance Level
609	K-S Test Statistic	0.204										Kolmogorov-Smirnov GOF
610	5% K-S Critical Value	0.275										Detected data appear Gamma Distributed at 5% Significance Level
611	Detected data appear Gamma Distributed at 5% Significance Level											
612	Gamma Statistics on Detected Data Only											
613	k hat (MLE)	0.899										k star (bias corrected MLE) 0.696
614	Theta hat (MLE)	9.303										Theta star (bias corrected MLE) 12.02
615	nu hat (MLE)	17.99										nu star (bias corrected) 13.92
616	Mean (detects)	8.366										
617	Gamma ROS Statistics using Imputed Non-Detects											
618	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
619	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
620	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
621	This is especially true when the sample size is small.											
622	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
623	Minimum	0.01										Mean 1.557
624	Maximum	34.3										Median 0.01
625	SD	5.367										CV 3.446
626	k hat (MLE)	0.189										k star (bias corrected MLE) 0.191
627	Theta hat (MLE)	8.23										Theta star (bias corrected MLE) 8.151
628	nu hat (MLE)	20.44										nu star (bias corrected) 20.64
629	Adjusted Level of Significance (β)	0.0456										
630	Approximate Chi Square Value (20.64, α)	11.32										Adjusted Chi Square Value (20.64, β) 11.13
631	95% Gamma Approximate UCL (use when n>=50)	2.839										95% Gamma Adjusted UCL (use when n<50) 2.887
632	Estimates of Gamma Parameters using KM Estimates											
633	Mean (KM)	2.022										SD (KM) 5.184
634	Variance (KM)	26.88										SE of Mean (KM) 0.744
635	k hat (KM)	0.152										k star (KM) 0.156
636	nu hat (KM)	16.43										nu star (KM) 16.85
637	theta hat (KM)	13.29										theta star (KM) 12.96
638	80% gamma percentile (KM)	2.271										90% gamma percentile (KM) 6.026
639	95% gamma percentile (KM)	11.04										99% gamma percentile (KM) 25.48
640	Gamma Kaplan-Meier (KM) Statistics											
641	Approximate Chi Square Value (16.85, α)	8.565										Adjusted Chi Square Value (16.85, β) 8.402

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	A	B	C	D	E	F	G	H	I	J	K	L						
642	95% Gamma Approximate KM-UCL (use when n>=50)				3.978		95% Gamma Adjusted KM-UCL (use when n<50)					4.055						
Lognormal GOF Test on Detected Observations Only																		
644	Shapiro Wilk Test Statistic			0.958			Shapiro Wilk GOF Test											
645	5% Shapiro Wilk Critical Value			0.842			Detected Data appear Lognormal at 5% Significance Level											
646	Lilliefors Test Statistic			0.165			Lilliefors GOF Test											
647	5% Lilliefors Critical Value			0.262			Detected Data appear Lognormal at 5% Significance Level											
648	Detected Data appear Lognormal at 5% Significance Level																	
649	Lognormal ROS Statistics Using Imputed Non-Detects																	
650	Mean in Original Scale			1.594			Mean in Log Scale			-2.868								
651	SD in Original Scale			5.356			SD in Log Scale			2.573								
652	95% t UCL (assumes normality of ROS data)			2.814			95% Percentile Bootstrap UCL			2.911								
653	95% BCA Bootstrap UCL			3.528			95% Bootstrap t UCL			4.346								
654	95% H-UCL (Log ROS)			7.84														
655	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																	
656	KM Mean (logged)			-0.17			KM Geo Mean			0.843								
657	KM SD (logged)			0.934			95% Critical H Value (KM-Log)			2.249								
658	KM Standard Error of Mean (logged)			0.134			95% H-UCL (KM -Log)			1.74								
659	KM SD (logged)			0.934			95% Critical H Value (KM-Log)			2.249								
660	KM Standard Error of Mean (logged)			0.134														
661	DL/2 Statistics																	
662	DL/2 Normal				DL/2 Log-Transformed													
663	Mean in Original Scale			1.821			Mean in Log Scale			-0.624								
664	SD in Original Scale			5.29			SD in Log Scale			1.133								
665	95% t UCL (Assumes normality)			3.026			95% H-Stat UCL			1.501								
666	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
667	Nonparametric Distribution Free UCL Statistics																	
668	Detected Data appear Gamma Distributed at 5% Significance Level																	
669	Suggested UCL to Use																	
670	95% KM Approximate Gamma UCL			3.978														
671																		

North Pit Soils 0 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L						
749	Bis(2-Ethylhexyl) Phthalate																	
750	General Statistics																	
751	Total Number of Observations				54	Number of Distinct Observations				42								
752						Number of Missing Observations				16								
753	Number of Detects				15	Number of Non-Detects				39								
754	Number of Distinct Detects				14	Number of Distinct Non-Detects				30								
755	Minimum Detect				0.0087	Minimum Non-Detect				0.0043								
756	Maximum Detect				84	Maximum Non-Detect				0.37								
757	Variance Detects				470.1	Percent Non-Detects				72.22%								
758	Mean Detects				5.621	SD Detects				21.68								
759	Median Detects				0.013	CV Detects				3.857								
760	Skewness Detects				3.873	Kurtosis Detects				15								
761	Mean of Logged Detects				-3.531	SD of Logged Detects				2.318								
762	Normal GOF Test on Detects Only																	
763	Shapiro Wilk Test Statistic				0.285	Shapiro Wilk GOF Test												
764	5% Shapiro Wilk Critical Value				0.881	Detected Data Not Normal at 5% Significance Level												
765	Lilliefors Test Statistic				0.534	Lilliefors GOF Test												
766	5% Lilliefors Critical Value				0.22	Detected Data Not Normal at 5% Significance Level												
767	Detected Data Not Normal at 5% Significance Level																	
768	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																	
769	KM Mean				1.567	KM Standard Error of Mean				1.595								
770	KM SD				11.32	95% KM (BCA) UCL				4.68								
771	95% KM (t) UCL				4.237	95% KM (Percentile Bootstrap) UCL				4.677								
772	95% KM (z) UCL				4.19	95% KM Bootstrap t UCL				1647								
773	90% KM Chebyshev UCL				6.352	95% KM Chebyshev UCL				8.519								
774	97.5% KM Chebyshev UCL				11.53	99% KM Chebyshev UCL				17.44								
775	Gamma GOF Tests on Detected Observations Only																	
776	A-D Test Statistic				4.546	Anderson-Darling GOF Test												
777	5% A-D Critical Value				0.931	Detected Data Not Gamma Distributed at 5% Significance Level												
778	K-S Test Statistic				0.493	Kolmogorov-Smirnov GOF												
779	5% K-S Critical Value				0.25	Detected Data Not Gamma Distributed at 5% Significance Level												
780	Detected Data Not Gamma Distributed at 5% Significance Level																	
781	Gamma Statistics on Detected Data Only																	
782	k hat (MLE)				0.147	k star (bias corrected MLE)				0.162								
783	Theta hat (MLE)				38.33	Theta star (bias corrected MLE)				34.75								
784	nu hat (MLE)				4.4	nu star (bias corrected)				4.853								
785	Mean (detects)				5.621													
786	Gamma ROS Statistics using Imputed Non-Detects																	
787	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																	
788	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																	
789	For such situations, GROS method may yield incorrect values of UCLs and BTVs																	
790	This is especially true when the sample size is small.																	
791	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																	
792	Minimum				0.0087	Mean				1.569								
793	Maximum				84	Median				0.01								
794	SD				11.43	CV				7.286								
795	k hat (MLE)				0.16	k star (bias corrected MLE)				0.163								
796	Theta hat (MLE)				9.802	Theta star (bias corrected MLE)				9.595								
797	nu hat (MLE)				17.28	nu star (bias corrected)				17.66								
798	Adjusted Level of Significance (β)				0.0456													
799	Approximate Chi Square Value (17.66, α)				9.144	Adjusted Chi Square Value (17.66, β)				8.975								
800	95% Gamma Approximate UCL (use when n>=50)				3.029	95% Gamma Adjusted UCL (use when n<50)				3.086								
801	Estimates of Gamma Parameters using KM Estimates																	
802	Mean (KM)				1.567	SD (KM)				11.32								
803	Variance (KM)				128.2	SE of Mean (KM)				1.595								
804	k hat (KM)				0.0191	k star (KM)				0.0304								
805	nu hat (KM)				2.068	nu star (KM)				3.286								
806	theta hat (KM)				81.84	theta star (KM)				51.49								
807	80% gamma percentile (KM)				0.0194	90% gamma percentile (KM)				0.945								
808	95% gamma percentile (KM)				6.145	99% gamma percentile (KM)				40.3								
809	Gamma Kaplan-Meier (KM) Statistics																	
810	Approximate Chi Square Value (3.29, α)				0.462	Adjusted Chi Square Value (3.29, β)				0.437								

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	A	B	C	D	E	F	G	H	I	J	K	L
811		95% Gamma Approximate KM-UCL (use when n>=50)			11.14		95% Gamma Adjusted KM-UCL (use when n<50)			11.79		
Lognormal GOF Test on Detected Observations Only												
813		Shapiro Wilk Test Statistic		0.537								Shapiro Wilk GOF Test
814		5% Shapiro Wilk Critical Value		0.881								Detected Data Not Lognormal at 5% Significance Level
815		Lilliefors Test Statistic		0.3								Lilliefors GOF Test
816		5% Lilliefors Critical Value		0.22								Detected Data Not Lognormal at 5% Significance Level
817	Detected Data Not Lognormal at 5% Significance Level											
818	Lognormal ROS Statistics Using Imputed Non-Detects											
819	Mean in Original Scale		1.562									Mean in Log Scale -6.286
820	SD in Original Scale		11.43									SD in Log Scale 2.285
821	95% t UCL (assumes normality of ROS data)		4.166									95% Percentile Bootstrap UCL 4.673
822	95% BCA Bootstrap UCL		6.231									95% Bootstrap t UCL 1958
823	95% H-UCL (Log ROS)		0.0915									
824	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
825	KM Mean (logged)		-4.723									KM Geo Mean 0.00889
826	KM SD (logged)		1.469									95% Critical H Value (KM-Log) 2.947
827	KM Standard Error of Mean (logged)		0.22									95% H-UCL (KM -Log) 0.0474
828	KM SD (logged)		1.469									95% Critical H Value (KM-Log) 2.947
829	KM Standard Error of Mean (logged)		0.22									
830	DL/2 Statistics											
831	DL/2 Normal				DL/2 Log-Transformed							
832	Mean in Original Scale		1.585									Mean in Log Scale -4.103
833	SD in Original Scale		11.43									SD in Log Scale 1.692
834	95% t UCL (Assumes normality)		4.188									95% H-Stat UCL 0.147
835	DL/2 is not a recommended method, provided for comparisons and historical reasons											
836	Nonparametric Distribution Free UCL Statistics											
837	Data do not follow a Discernible Distribution at 5% Significance Level											
838	Suggested UCL to Use											
839	95% KM (Chebyshev) UCL		8.519									
840												

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	A	B	C	D	E	F	G	H	I	J	K	L						
841	High Molecular Weight PAHs																	
842	General Statistics																	
843	Total Number of Observations				54	Number of Distinct Observations				53								
844						Number of Missing Observations				16								
845	Number of Detects				51	Number of Non-Detects				3								
846	Number of Distinct Detects				50	Number of Distinct Non-Detects				3								
847	Minimum Detect				0.0216	Minimum Non-Detect				0.0158								
848	Maximum Detect				2.95	Maximum Non-Detect				0.0178								
849	Variance Detects				0.442	Percent Non-Detects				5.556%								
850	Mean Detects				0.552	SD Detects				0.664								
851	Median Detects				0.283	CV Detects				1.203								
852	Skewness Detects				2.039	Kurtosis Detects				4.022								
853	Mean of Logged Detects				-1.259	SD of Logged Detects				1.251								
854	Normal GOF Test on Detects Only																	
855	Shapiro Wilk Test Statistic				0.738	Normal GOF Test on Detected Observations Only												
856	5% Shapiro Wilk P Value				2.251E-11	Detected Data Not Normal at 5% Significance Level												
857	Lilliefors Test Statistic				0.231	Lilliefors GOF Test												
858	5% Lilliefors Critical Value				0.123	Detected Data Not Normal at 5% Significance Level												
859	Detected Data Not Normal at 5% Significance Level																	
860	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																	
861	KM Mean				0.522	KM Standard Error of Mean				0.0895								
862	KM SD				0.651	95% KM (BCA) UCL				0.683								
863	95% KM (t) UCL				0.672	95% KM (Percentile Bootstrap) UCL				0.677								
864	95% KM (z) UCL				0.67	95% KM Bootstrap t UCL				0.709								
865	90% KM Chebyshev UCL				0.791	95% KM Chebyshev UCL				0.912								
866	97.5% KM Chebyshev UCL				1.081	99% KM Chebyshev UCL				1.413								
867	Gamma GOF Tests on Detected Observations Only																	
868	A-D Test Statistic				0.555	Anderson-Darling GOF Test												
869	5% A-D Critical Value				0.786	Detected data appear Gamma Distributed at 5% Significance Level												
870	K-S Test Statistic				0.114	Kolmogorov-Smirnov GOF												
871	5% K-S Critical Value				0.129	Detected data appear Gamma Distributed at 5% Significance Level												
872	Detected data appear Gamma Distributed at 5% Significance Level																	
873	Gamma Statistics on Detected Data Only																	
874	k hat (MLE)				0.881	k star (bias corrected MLE)				0.842								
875	Theta hat (MLE)				0.627	Theta star (bias corrected MLE)				0.656								
876	nu hat (MLE)				89.87	nu star (bias corrected)				85.91								
877	Mean (detects)				0.552													
878	Gamma ROS Statistics using Imputed Non-Detects																	
879	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																	
880	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																	
881	For such situations, GROS method may yield incorrect values of UCLs and BTVs																	
882	This is especially true when the sample size is small.																	
883	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																	
884	Minimum				0.01	Mean				0.522								
885	Maximum				2.95	Median				0.259								
886	SD				0.657	CV				1.259								
887	k hat (MLE)				0.753	k star (bias corrected MLE)				0.723								
888	Theta hat (MLE)				0.694	Theta star (bias corrected MLE)				0.722								
889	nu hat (MLE)				81.28	nu star (bias corrected)				78.09								
890	Adjusted Level of Significance (β)				0.0456													
891	Approximate Chi Square Value (78.09, α)				58.74	Adjusted Chi Square Value (78.09, β)				58.28								
892	95% Gamma Approximate UCL (use when n>=50)				0.694	95% Gamma Adjusted UCL (use when n<50)				0.7								
893	Estimates of Gamma Parameters using KM Estimates																	
894	Mean (KM)				0.522	SD (KM)				0.651								
895	Variance (KM)				0.424	SE of Mean (KM)				0.0895								
896	k hat (KM)				0.644	k star (KM)				0.62								
897	nu hat (KM)				69.52	nu star (KM)				66.99								
898	theta hat (KM)				0.812	theta star (KM)				0.842								
899	80% gamma percentile (KM)				0.861	90% gamma percentile (KM)				1.348								
900	95% gamma percentile (KM)				1.857	99% gamma percentile (KM)				3.085								
901	Gamma Kaplan-Meier (KM) Statistics																	
902	Approximate Chi Square Value (66.99, α)				49.15	Adjusted Chi Square Value (66.99, β)				48.73								

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	A	B	C	D	E	F	G	H	I	J	K	L								
903	95% Gamma Approximate KM-UCL (use when n>=50)		0.712		95% Gamma Adjusted KM-UCL (use when n<50)			0.718												
Lognormal GOF Test on Detected Observations Only																				
905	Shapiro Wilk Approximate Test Statistic		0.967		Shapiro Wilk GOF Test															
906	5% Shapiro Wilk P Value		0.286		Detected Data appear Lognormal at 5% Significance Level															
907	Lilliefors Test Statistic		0.0528		Lilliefors GOF Test															
908	5% Lilliefors Critical Value		0.123		Detected Data appear Lognormal at 5% Significance Level															
909	Detected Data appear Lognormal at 5% Significance Level																			
910	Lognormal ROS Statistics Using Imputed Non-Detects																			
911	Mean in Original Scale		0.522		Mean in Log Scale															
912	SD in Original Scale		0.657		SD in Log Scale															
913	95% t UCL (assumes normality of ROS data)		0.672		95% Percentile Bootstrap UCL															
914	95% BCA Bootstrap UCL		0.689		95% Bootstrap t UCL															
915	95% H-UCL (Log ROS)		1.094																	
916	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																			
917	KM Mean (logged)		-1.42		KM Geo Mean															
918	KM SD (logged)		1.374		95% Critical H Value (KM-Log)															
919	KM Standard Error of Mean (logged)		0.189		95% H-UCL (KM -Log)															
920	KM SD (logged)		1.374		95% Critical H Value (KM-Log)															
921	KM Standard Error of Mean (logged)		0.189																	
922	DL/2 Statistics																			
923	DL/2 Normal				DL/2 Log-Transformed															
924	Mean in Original Scale		0.522		Mean in Log Scale															
925	SD in Original Scale		0.658		SD in Log Scale															
926	95% t UCL (Assumes normality)		0.672		95% H-Stat UCL															
927	DL/2 is not a recommended method, provided for comparisons and historical reasons																			
928	Nonparametric Distribution Free UCL Statistics																			
929	Detected Data appear Gamma Distributed at 5% Significance Level																			
930	Suggested UCL to Use																			
931	95% KM Approximate Gamma UCL		0.712																	

**0 - 0.5 ft bgs Soil Analytical Data Summary North Area
Brine Service Company Superfund Site**

Location	Depth	Barium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	D_Selenium	Zinc	Mercury	Cyanide	D_Cyanide	Aldrin	D_Aldrin	Endrin	D_Endrin	BEP	D_BEP	HMWPAH	D_HMWPAH
ENSS01	0-0.5 ft	6.68E+02	1.51E+01	2.56E+01	2.69E+01	5.92E+01	6.74E+00	4.61E-01	1	7.56E+02	8.97E-01	2.48E+00	1	1.70E-03	0	3.40E-03	0	1.10E-01	0	2.53E-01	1
ENSS02	0-0.5 ft	1.08E+03	1.76E+00	8.69E+00	1.38E+01	4.88E+01	2.97E+00	3.09E-01	1	8.90E+02	7.23E-02	1.07E+01	1	1.50E-03	0	3.00E-03	0	7.20E-02	0	2.10E-01	1
ENSS03	0-0.5 ft	1.16E+03	7.45E-01	8.26E+00	7.40E+00	3.77E+01	3.49E+00	4.21E-01	1	9.60E+02	2.53E-01	1.08E+01	1	1.60E-03	0	3.10E-03	0	1.20E-01	0	3.28E-01	1
ENSS03	0-0.5 ft	1.05E+03	1.06E+00	8.00E+00	7.26E+00	3.98E+01	3.60E+00	3.95E-01	1	6.58E+02	2.73E-01	5.90E-01	0	3.10E-04	0	6.30E-04	0	1.00E-01	0	3.71E-01	1
ENSS04	0-0.5 ft	4.93E+02	2.35E-01	5.34E+00	5.82E+00	1.77E+01	4.44E+00	3.51E-01	1	9.68E+01	4.46E-02	3.94E+00	1	3.30E-04	0	6.60E-04	0	2.90E-02	0	1.76E-01	1
ENSS05	0-0.5 ft	1.61E+03	1.16E+00	8.64E+00	9.49E+00	4.50E+01	5.39E+00	4.84E-01	1	3.62E+02	4.49E-01	1.46E+01	1	1.60E-03	0	3.30E-03	0	8.70E-02	0	3.43E-01	1
ENSS06	0-0.5 ft	1.18E+04	7.02E-01	1.53E+01	1.30E+01	5.71E+01	6.20E+00	3.53E-01	1	3.96E+02	2.48E-01	6.10E-01	0	3.10E-03	0	6.20E-03	0	3.20E-01	0	2.16E-01	1
ENSS07	0-0.5 ft	9.79E+02	1.08E+00	5.71E+00	7.20E+00	1.24E+01	5.34E+00	7.52E+00	1	1.96E+02	9.73E-02	6.30E-01	0	1.60E-03	0	3.20E-03	0	7.10E-03	0	1.58E-02	0
ENSS08	0-0.5 ft	1.38E+03	1.56E+01	9.85E+00	9.08E+00	3.80E+01	5.70E+00	6.51E+00	1	3.56E+02	1.90E-01	3.43E+01	1	3.50E-04	0	6.90E-04	0	1.60E-01	0	1.72E-01	1
ENSS09	0-0.5 ft										4.04E-02										
ENSS10	0-0.5 ft										5.26E-01										
ENSS11	0-0.5 ft										5.80E-01										
ENSS11	0-0.5 ft										4.51E-01										
ESSS06	0-0.5 ft	6.36E+02	5.74E+00	3.71E+01	2.26E+01	1.38E+02	7.68E+00	4.96E+00	1	7.15E+02	8.97E+00	6.60E-01	0	3.40E-03	0	6.80E-03	0	7.50E-02	0	8.68E-01	1
ESSS07	0-0.5 ft	1.78E+02	9.23E-01	7.98E+00	5.69E+00	3.59E+01	2.38E+00	2.40E-01	0	2.43E+03	3.42E-02	2.88E+00	1	1.50E-03	0	3.00E-03	0	6.10E-02	0	2.38E-01	1
ESSS08	0-0.5 ft	3.32E+02	3.51E-01	4.01E+00	5.48E+00	1.29E+01	3.61E+00	3.93E-01	1	4.51E+01	2.40E-01	5.90E-01	0	1.60E-03	0	3.20E-03	0	1.20E-02	0	2.64E-01	1
NPSS01	0-0.5 ft	2.93E+02	1.27E+00	6.18E+01	1.43E+01	1.36E+02	1.23E+01	5.84E-01	1	1.03E+03	2.96E-01	6.20E-01	0	1.60E-03	0	3.20E-03	0	8.40E+01	1	1.18E+00	1
NPSS02	0-0.5 ft	3.70E+02	1.38E+00	1.90E+01	1.56E+01	6.36E+01	7.73E+00	2.80E+00	0	3.61E+02	1.66E+00	6.90E-01	0	3.50E-03	0	7.10E-03	0	1.70E-02	0	2.16E+00	1
NPSS03	0-0.5 ft	4.68E+02	7.38E+00	3.05E+01	2.72E+01	1.73E+02	6.10E+00	2.50E+00	1	9.62E+02	4.14E+00	6.70E-01	0	3.40E-04	0	4.40E-03	1	9.00E-02	1	1.59E+00	1
NPSS04	0-0.5 ft	3.59E+03	2.08E+00	1.30E+01	8.26E+00	5.35E+01	4.10E+00	2.40E+00	0	1.13E+03	3.40E-01	5.80E-01	0	1.50E-03	0	3.00E-03	0	3.20E-01	0	1.37E-01	1
NPSS05	0-0.5 ft	5.22E+02	9.47E+00	3.53E+01	3.45E+01	1.58E+02	6.48E+00	1.20E+01	1	8.88E+02	7.55E+00	6.40E-01	0	2.40E-02	1	6.10E-02	1	3.70E-02	0	2.58E+00	1
NPSS06	0-0.5 ft	1.42E+03	2.06E+00	1.92E+01	1.81E+01	3.70E+01	1.51E+01	2.70E+00	1	4.96E+02	4.35E-01	6.30E-01	0	3.40E-03	0	6.70E-03	0	7.40E-03	0	1.90E-01	1
NPSS07	0-0.5 ft	1.01E+03	5.60E+00	6.15E+01	2.59E+01	1.80E+03	1.20E+01	5.41E+00	1	1.13E+03	1.50E+00	6.90E-01	0	3.50E-03	0	6.90E-03	0	1.90E-01	0	1.17E+00	1
NPSS08	0-0.5 ft	3.27E+02	9.07E-01	8.16E+00	7.15E+00	1.01E+01	1.03E+01	2.60E+00	0	1.16E+02	1.25E-01	6.20E-01	0	3.30E-03	0	6.70E-03	0	3.70E-01	0	8.10E-01	1
NPSS08	0-0.5 ft	3.14E+02	7.43E-01	8.28E+00	5.84E+00	9.25E+00	8.35E+00	2.60E+00	0	1.11E+02	1.42E-01	6.20E-01	0	3.30E-03	0	6.					

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L										
1					UCL Statistics for Uncensored Full Data Sets																	
2		User Selected Options	North Pit 0-0.5 feet bgs																			
3		Date/Time of Computation	ProUCL 5.112/15/2017 11:17:49 AM																			
4		From File	171215 Summary Tables Soil Statistics_a.xls																			
5		Full Precision	OFF																			
6		Confidence Coefficient	95%																			
7		Number of Bootstrap Operations	2000																			
8																						

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
71												
72												
73					Total Number of Observations	25						
74												
75					Minimum	0.235						
76					Maximum	15.6						
77					SD	4.317						
78					Coefficient of Variation	1.302						
79												
80												
81					Shapiro Wilk Test Statistic	0.68						
82					5% Shapiro Wilk Critical Value	0.918						
83					Lilliefors Test Statistic	0.31						
84					5% Lilliefors Critical Value	0.173						
85												
86												
87					95% Normal UCL							
88					95% Student's-t UCL	4.793						
89												
90					95% UCLs (Adjusted for Skewness)							
91					95% Adjusted-CLT UCL (Chen-1995)							
92					95% Modified-t UCL (Johnson-1978)							
93												
94					Gamma GOF Test							
95					A-D Test Statistic	1.18						
96					5% A-D Critical Value	0.777						
97					K-S Test Statistic	0.201						
98					5% K-S Critical Value	0.18						
99												
100					Data Not Gamma Distributed at 5% Significance Level							
101					Gamma Statistics							
102					k hat (MLE)	0.902						
103					Theta hat (MLE)	3.676						
104					nu hat (MLE)	45.1						
105					MLE Mean (bias corrected)	3.316						
106												
107					MLE Sd (bias corrected)							
108					Approximate Chi Square Value (0.05)							
109					Adjusted Level of Significance	0.0395						
110					Adjusted Chi Square Value							
111												
112					Assuming Gamma Distribution							
113					95% Approximate Gamma UCL (use when n>=50))	4.974						
114					95% Adjusted Gamma UCL (use when n<50)							
115												
116					Lognormal GOF Test							
117					Shapiro Wilk Test Statistic	0.953						
118					5% Shapiro Wilk Critical Value	0.918						
119					Lilliefors Test Statistic	0.14						
120					5% Lilliefors Critical Value	0.173						
121												
122					Data appear Lognormal at 5% Significance Level							
123					Nonparametric Distribution Free UCL Statistics							
124					Data appear to follow a Discremable Distribution at 5% Significance Level							
125					Nonparametric Distribution Free UCLs							
126					95% CLT UCL	6.141						
127					90% Chebyshev (MVUE) UCL							
128					95% Standard Bootstrap UCL	4.691						
129					95% Hall's Bootstrap UCL	5.495						
130					95% BCA Bootstrap UCL	5.176						
131					90% Chebyshev(Mean, Sd) UCL	5.906						
132					97.5% Chebyshev(Mean, Sd) UCL	8.707						
133					95% Chebyshev(Mean, Sd) UCL							
134					95% Jackknife UCL							
135					95% Bootstrap-t UCL							
136					95% Percentile Bootstrap UCL							
137					95% Chebyshev(Means, Sds) UCL							
138					99% Chebyshev(Means, Sds) UCL							
139					99.9% Chebyshev(Means, Sds) UCL							
140					Suggested UCL to Use							
141					95% H-UCL	6.141						
142					ProUCL computes and outputs H-statistic based UCLs for historical reasons only.							
143					H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.							
144					It is therefore recommended to avoid the use of H-statistic based 95% UCLs.							
145					Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.							

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
Chromium																			
General Statistics																			
135	Total Number of Observations			25	Number of Distinct Observations			25											
136					Number of Missing Observations			4											
137	Minimum			4.01	Mean			20.62											
138	Maximum			61.8	Median			13											
139	SD			17.37	Std. Error of Mean			3.473											
140	Coefficient of Variation			0.842	Skewness			1.308											
141	Normal GOF Test																		
142	Shapiro Wilk Test Statistic			0.807	Shapiro Wilk GOF Test														
143	5% Shapiro Wilk Critical Value			0.918	Data Not Normal at 5% Significance Level														
144	Lilliefors Test Statistic			0.22	Lilliefors GOF Test														
145	5% Lilliefors Critical Value			0.173	Data Not Normal at 5% Significance Level														
146	Data Not Normal at 5% Significance Level																		
147	Assuming Normal Distribution																		
148	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
149	95% Student's-t UCL			26.57	95% Adjusted-CLT UCL (Chen-1995)			27.31											
150					95% Modified-t UCL (Johnson-1978)			26.72											
151	Gamma GOF Test																		
152	A-D Test Statistic			0.898	Anderson-Darling Gamma GOF Test														
153	5% A-D Critical Value			0.759	Data Not Gamma Distributed at 5% Significance Level														
154	K-S Test Statistic			0.169	Kolmogorov-Smirnov Gamma GOF Test														
155	5% K-S Critical Value			0.177	Detected data appear Gamma Distributed at 5% Significance Level														
156	Detected data follow Appr. Gamma Distribution at 5% Significance Level																		
157	Gamma Statistics																		
158	k hat (MLE)			1.761	k star (bias corrected MLE)			1.576											
159	Theta hat (MLE)			11.71	Theta star (bias corrected MLE)			13.09											
160	nu hat (MLE)			88.03	nu star (bias corrected)			78.8											
161	MLE Mean (bias corrected)			20.62	MLE Sd (bias corrected)			16.43											
162	Approximate Chi Square Value (0.05)																		
163	Adjusted Level of Significance			0.0395	Adjusted Chi Square Value			58.2											
164	Assuming Gamma Distribution																		
165	95% Approximate Gamma UCL (use when n>=50)			27.38	95% Adjusted Gamma UCL (use when n<50)			27.93											
166	Lognormal GOF Test																		
167	Shapiro Wilk Test Statistic			0.939	Shapiro Wilk Lognormal GOF Test														
168	5% Shapiro Wilk Critical Value			0.918	Data appear Lognormal at 5% Significance Level														
169	Lilliefors Test Statistic			0.157	Lilliefors Lognormal GOF Test														
170	5% Lilliefors Critical Value			0.173	Data appear Lognormal at 5% Significance Level														
171	Data appear Lognormal at 5% Significance Level																		
172	Lognormal Statistics																		
173	Minimum of Logged Data			1.389	Mean of logged Data			2.716											
174	Maximum of Logged Data			4.124	SD of logged Data			0.795											
175	Assuming Lognormal Distribution																		
176	95% H-UCL			29.88	90% Chebyshev (MVUE) UCL			31.06											
177	95% Chebyshev (MVUE) UCL			35.89	97.5% Chebyshev (MVUE) UCL			42.58											
178	99% Chebyshev (MVUE) UCL			55.73															
179	Nonparametric Distribution Free UCL Statistics																		
180	Data appear to follow a Discremable Distribution at 5% Significance Level																		
181	Nonparametric Distribution Free UCLs																		
182	95% CLT UCL			26.34	95% Jackknife UCL			26.57											
183	95% Standard Bootstrap UCL			25.99	95% Bootstrap-t UCL			28.58											
184	95% Hall's Bootstrap UCL			26.79	95% Percentile Bootstrap UCL			26.31											
185	95% BCA Bootstrap UCL			26.91															
186	90% Chebyshev(Mean, Sd) UCL			31.04	95% Chebyshev(Mean, Sd) UCL			35.76											
187	97.5% Chebyshev(Mean, Sd) UCL			42.32	99% Chebyshev(Mean, Sd) UCL			55.18											
188	Suggested UCL to Use																		
189	95% Adjusted Gamma UCL			27.93															
190	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																		
191	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																		
192																			

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
193	Copper																		
194	General Statistics																		
195	Total Number of Observations			25	Number of Distinct Observations			25											
196					Number of Missing Observations			4											
197	Minimum			5.48					Mean			13.94							
198	Maximum			34.5					Median			10.8							
199	SD			8.361					Std. Error of Mean			1.672							
200	Coefficient of Variation			0.6					Skewness			0.929							
201	Normal GOF Test																		
202	Shapiro Wilk Test Statistic			0.872	Shapiro Wilk GOF Test														
203	5% Shapiro Wilk Critical Value			0.918	Data Not Normal at 5% Significance Level														
204	Lilliefors Test Statistic			0.183	Lilliefors GOF Test														
205	5% Lilliefors Critical Value			0.173	Data Not Normal at 5% Significance Level														
206	Data Not Normal at 5% Significance Level																		
207	Assuming Normal Distribution																		
208	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
209	95% Student's-t UCL			16.8	95% Adjusted-CLT UCL (Chen-1995)			17.03											
210					95% Modified-t UCL (Johnson-1978)			16.86											
211	Gamma GOF Test																		
212	A-D Test Statistic			0.782	Anderson-Darling Gamma GOF Test														
213	5% A-D Critical Value			0.751	Data Not Gamma Distributed at 5% Significance Level														
214	K-S Test Statistic			0.156	Kolmogorov-Smirnov Gamma GOF Test														
215	5% K-S Critical Value			0.176	Detected data appear Gamma Distributed at 5% Significance Level														
216	Detected data follow Appr. Gamma Distribution at 5% Significance Level																		
217	Gamma Statistics																		
218	k hat (MLE)			3.191	k star (bias corrected MLE)			2.835											
219	Theta hat (MLE)			4.369	Theta star (bias corrected MLE)			4.918											
220	nu hat (MLE)			159.6	nu star (bias corrected)			141.8											
221	MLE Mean (bias corrected)			13.94	MLE Sd (bias corrected)			8.281											
222					Approximate Chi Square Value (0.05)			115.2											
223	Adjusted Level of Significance			0.0395	Adjusted Chi Square Value			113.6											
224	Assuming Gamma Distribution																		
225	95% Approximate Gamma UCL (use when n>=50)			17.15	95% Adjusted Gamma UCL (use when n<50)			17.4											
226	Lognormal GOF Test																		
227	Shapiro Wilk Test Statistic			0.922	Shapiro Wilk Lognormal GOF Test														
228	5% Shapiro Wilk Critical Value			0.918	Data appear Lognormal at 5% Significance Level														
229	Lilliefors Test Statistic			0.15	Lilliefors Lognormal GOF Test														
230	5% Lilliefors Critical Value			0.173	Data appear Lognormal at 5% Significance Level														
231	Data appear Lognormal at 5% Significance Level																		
232	Lognormal Statistics																		
233	Minimum of Logged Data			1.701	Mean of logged Data			2.47											
234	Maximum of Logged Data			3.541	SD of logged Data			0.582											
235	Assuming Lognormal Distribution																		
236	95% H-UCL			17.82	90% Chebyshev (MVUE) UCL			19.01											
237	95% Chebyshev (MVUE) UCL			21.32	97.5% Chebyshev (MVUE) UCL			24.54											
238	99% Chebyshev (MVUE) UCL			30.85															
239	Nonparametric Distribution Free UCL Statistics																		
240	Data appear to follow a Discernible Distribution at 5% Significance Level																		
241	Nonparametric Distribution Free UCLs																		
242	95% CLT UCL			16.69	95% Jackknife UCL			16.8											
243	95% Standard Bootstrap UCL			16.71	95% Bootstrap-t UCL			17.25											
244	95% Hall's Bootstrap UCL			17	95% Percentile Bootstrap UCL			16.71											
245	95% BCA Bootstrap UCL			16.91															
246	90% Chebyshev(Mean, Sd) UCL			18.96	95% Chebyshev(Mean, Sd) UCL			21.23											
247	97.5% Chebyshev(Mean, Sd) UCL			24.39	99% Chebyshev(Mean, Sd) UCL			30.58											
248	Suggested UCL to Use																		
249	95% Adjusted Gamma UCL			17.4															
250	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																		
251	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																		
252																			

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
253						Lead						
254						General Statistics						
255				Total Number of Observations	25			Number of Distinct Observations	25			
256								Number of Missing Observations	4			
257				Minimum	9.25					Mean	129.8	
258				Maximum	1800					Median	45	
259				SD	351.4			Std. Error of Mean	70.28			
260				Coefficient of Variation	2.707			Skewness	4.844			
261				Normal GOF Test								
262				Shapiro Wilk Test Statistic	0.315		Shapiro Wilk GOF Test					
263				5% Shapiro Wilk Critical Value	0.918			Data Not Normal at 5% Significance Level				
264				Lilliefors Test Statistic	0.411		Lilliefors GOF Test					
265				5% Lilliefors Critical Value	0.173			Data Not Normal at 5% Significance Level				
266				Data Not Normal at 5% Significance Level								
267				Assuming Normal Distribution								
268				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
269				95% Student's-t UCL	250.1		95% Adjusted-CLT UCL (Chen-1995)	318.2				
270							95% Modified-t UCL (Johnson-1978)	261.4				
271				Gamma GOF Test								
272				A-D Test Statistic	2.282		Anderson-Darling Gamma GOF Test					
273				5% A-D Critical Value	0.795			Data Not Gamma Distributed at 5% Significance Level				
274				K-S Test Statistic	0.246		Kolmogorov-Smirnov Gamma GOF Test					
275				5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level				
276				Data Not Gamma Distributed at 5% Significance Level								
277				Gamma Statistics								
278				k hat (MLE)	0.629		k star (bias corrected MLE)	0.58				
279				Theta hat (MLE)	206.4		Theta star (bias corrected MLE)	223.7				
280				nu hat (MLE)	31.45		nu star (bias corrected)	29.01				
281				MLE Mean (bias corrected)	129.8		MLE Sd (bias corrected)	170.4				
282							Approximate Chi Square Value (0.05)	17.72				
283				Adjusted Level of Significance	0.0395		Adjusted Chi Square Value	17.12				
284				Assuming Gamma Distribution								
285				95% Approximate Gamma UCL (use when n>=50))	212.6		95% Adjusted Gamma UCL (use when n<50)	220				
286				Lognormal GOF Test								
287				Shapiro Wilk Test Statistic	0.915		Shapiro Wilk Lognormal GOF Test					
288				5% Shapiro Wilk Critical Value	0.918			Data Not Lognormal at 5% Significance Level				
289				Lilliefors Test Statistic	0.131		Lilliefors Lognormal GOF Test					
290				5% Lilliefors Critical Value	0.173			Data appear Lognormal at 5% Significance Level				
291				Data appear Approximate Lognormal at 5% Significance Level								
292				Lognormal Statistics								
293				Minimum of Logged Data	2.225		Mean of logged Data	3.891				
294				Maximum of Logged Data	7.496		SD of logged Data	1.16				
295				Assuming Lognormal Distribution								
296				95% H-UCL	181.9		90% Chebyshev (MVUE) UCL	166.8				
297				95% Chebyshev (MVUE) UCL	200.7		97.5% Chebyshev (MVUE) UCL	247.7				
298				99% Chebyshev (MVUE) UCL	340.2							
299				Nonparametric Distribution Free UCL Statistics								
300				Data appear to follow a Discremable Distribution at 5% Significance Level								
301				Nonparametric Distribution Free UCLs								
302				95% CLT UCL	245.4		95% Jackknife UCL	250.1				
303				95% Standard Bootstrap UCL	244.3		95% Bootstrap-t UCL	803				
304				95% Hall's Bootstrap UCL	680.7		95% Percentile Bootstrap UCL	267.2				
305				95% BCA Bootstrap UCL	353.2							
306				90% Chebyshev(Mean, Sd) UCL	340.7		95% Chebyshev(Mean, Sd) UCL	436.2				
307				97.5% Chebyshev(Mean, Sd) UCL	568.7		99% Chebyshev(Mean, Sd) UCL	829.1				
308				Suggested UCL to Use								
309				95% H-UCL	181.9							
310				ProUCL computes and outputs H-statistic based UCLs for historical reasons only.								
311				H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.								
312				It is therefore recommended to avoid the use of H-statistic based 95% UCLs.								
313				Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.								
314												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
315						Nickel						
316						General Statistics						
317				Total Number of Observations	25			Number of Distinct Observations	25			
318								Number of Missing Observations	4			
319				Minimum	2.38					Mean	7.32	
320				Maximum	15.4					Median	6.48	
321				SD	3.654			Std. Error of Mean	0.731			
322				Coefficient of Variation	0.499			Skewness	0.825			
323						Normal GOF Test						
324				Shapiro Wilk Test Statistic	0.92			Shapiro Wilk GOF Test				
325				5% Shapiro Wilk Critical Value	0.918			Data appear Normal at 5% Significance Level				
326				Lilliefors Test Statistic	0.149			Lilliefors GOF Test				
327				5% Lilliefors Critical Value	0.173			Data appear Normal at 5% Significance Level				
328						Data appear Normal at 5% Significance Level						
329						Assuming Normal Distribution						
330					95% Normal UCL			95% UCLs (Adjusted for Skewness)				
331				95% Student's-t UCL	8.571			95% Adjusted-CLT UCL (Chen-1995)	8.651			
332								95% Modified-t UCL (Johnson-1978)	8.591			
333						Gamma GOF Test						
334				A-D Test Statistic	0.248			Anderson-Darling Gamma GOF Test				
335				5% A-D Critical Value	0.748			Detected data appear Gamma Distributed at 5% Significance Level				
336				K-S Test Statistic	0.0902			Kolmogorov-Smirnov Gamma GOF Test				
337				5% K-S Critical Value	0.175			Detected data appear Gamma Distributed at 5% Significance Level				
338						Detected data appear Gamma Distributed at 5% Significance Level						
339						Gamma Statistics						
340				k hat (MLE)	4.336			k star (bias corrected MLE)	3.842			
341				Theta hat (MLE)	1.688			Theta star (bias corrected MLE)	1.905			
342				nu hat (MLE)	216.8			nu star (bias corrected)	192.1			
343				MLE Mean (bias corrected)	7.32			MLE Sd (bias corrected)	3.735			
344								Approximate Chi Square Value (0.05)	161			
345				Adjusted Level of Significance	0.0395			Adjusted Chi Square Value	159.1			
346						Assuming Gamma Distribution						
347				95% Approximate Gamma UCL (use when n>=50))	8.733			95% Adjusted Gamma UCL (use when n<50)	8.839			
348						Lognormal GOF Test						
349				Shapiro Wilk Test Statistic	0.975			Shapiro Wilk Lognormal GOF Test				
350				5% Shapiro Wilk Critical Value	0.918			Data appear Lognormal at 5% Significance Level				
351				Lilliefors Test Statistic	0.0769			Lilliefors Lognormal GOF Test				
352				5% Lilliefors Critical Value	0.173			Data appear Lognormal at 5% Significance Level				
353						Data appear Lognormal at 5% Significance Level						
354						Lognormal Statistics						
355				Minimum of Logged Data	0.867			Mean of logged Data	1.871			
356				Maximum of Logged Data	2.734			SD of logged Data	0.506			
357						Assuming Lognormal Distribution						
358				95% H-UCL	9.045			90% Chebyshev (MVUE) UCL	9.665			
359				95% Chebyshev (MVUE) UCL	10.72			97.5% Chebyshev (MVUE) UCL	12.18			
360				99% Chebyshev (MVUE) UCL	15.05							
361						Nonparametric Distribution Free UCL Statistics						
362						Data appear to follow a Discremable Distribution at 5% Significance Level						
363						Nonparametric Distribution Free UCLs						
364				95% CLT UCL	8.523			95% Jackknife UCL	8.571			
365				95% Standard Bootstrap UCL	8.491			95% Bootstrap-t UCL	8.674			
366				95% Hall's Bootstrap UCL	8.667			95% Percentile Bootstrap UCL	8.48			
367				95% BCA Bootstrap UCL	8.557							
368				90% Chebyshev(Mean, Sd) UCL	9.513			95% Chebyshev(Mean, Sd) UCL	10.51			
369				97.5% Chebyshev(Mean, Sd) UCL	11.88			99% Chebyshev(Mean, Sd) UCL	14.59			
370						Suggested UCL to Use						
371				95% Student's-t UCL	8.571							
372												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
373						Zinc						
374						General Statistics						
375					Total Number of Observations	25			Number of Distinct Observations	24		
376									Number of Missing Observations	4		
377					Minimum	45.7			Mean	643.7		
378					Maximum	2430			Median	658		
379					SD	518.8			Std. Error of Mean	103.8		
380					Coefficient of Variation	0.806			Skewness	1.622		
381					Normal GOF Test							
382					Shapiro Wilk Test Statistic	0.851			Shapiro Wilk GOF Test			
383					5% Shapiro Wilk Critical Value	0.918			Data Not Normal at 5% Significance Level			
384					Lilliefors Test Statistic	0.134			Lilliefors GOF Test			
385					5% Lilliefors Critical Value	0.173			Data appear Normal at 5% Significance Level			
386					Data appear Approximate Normal at 5% Significance Level							
387					Assuming Normal Distribution							
388					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
389					95% Student's-t UCL	821.2			95% Adjusted-CLT UCL (Chen-1995)	850.3		
390									95% Modified-t UCL (Johnson-1978)	826.8		
391					Gamma GOF Test							
392					A-D Test Statistic	0.572			Anderson-Darling Gamma GOF Test			
393					5% A-D Critical Value	0.763			Detected data appear Gamma Distributed at 5% Significance Level			
394					K-S Test Statistic	0.141			Kolmogorov-Smirnov Gamma GOF Test			
395					5% K-S Critical Value	0.178			Detected data appear Gamma Distributed at 5% Significance Level			
396					Detected data appear Gamma Distributed at 5% Significance Level							
397					Gamma Statistics							
398					k hat (MLE)	1.436			k star (bias corrected MLE)	1.29		
399					Theta hat (MLE)	448.3			Theta star (bias corrected MLE)	498.9		
400					nu hat (MLE)	71.8			nu star (bias corrected)	64.52		
401					MLE Mean (bias corrected)	643.7			MLE Sd (bias corrected)	566.7		
402									Approximate Chi Square Value (0.05)	47.04		
403					Adjusted Level of Significance	0.0395			Adjusted Chi Square Value	46.02		
404					Assuming Gamma Distribution							
405					95% Approximate Gamma UCL (use when n>=50))	882.9			95% Adjusted Gamma UCL (use when n<50)	902.5		
406					Lognormal GOF Test							
407					Shapiro Wilk Test Statistic	0.918			Shapiro Wilk Lognormal GOF Test			
408					5% Shapiro Wilk Critical Value	0.918			Data Not Lognormal at 5% Significance Level			
409					Lilliefors Test Statistic	0.176			Lilliefors Lognormal GOF Test			
410					5% Lilliefors Critical Value	0.173			Data Not Lognormal at 5% Significance Level			
411					Data Not Lognormal at 5% Significance Level							
412					Lognormal Statistics							
413					Minimum of Logged Data	3.809			Mean of logged Data	6.08		
414					Maximum of Logged Data	7.796			SD of logged Data	1.018		
415					Assuming Lognormal Distribution							
416					95% H-UCL	1239			90% Chebyshev (MVUE) UCL	1209		
417					95% Chebyshev (MVUE) UCL	1434			97.5% Chebyshev (MVUE) UCL	1746		
418					99% Chebyshev (MVUE) UCL	2359						
419					Nonparametric Distribution Free UCL Statistics							
420					Data appear to follow a Discremable Distribution at 5% Significance Level							
421					Nonparametric Distribution Free UCLs							
422					95% CLT UCL	814.4			95% Jackknife UCL	821.2		
423					95% Standard Bootstrap UCL	806			95% Bootstrap-t UCL	860.7		
424					95% Hall's Bootstrap UCL	963.2			95% Percentile Bootstrap UCL	815.6		
425					95% BCA Bootstrap UCL	841						
426					90% Chebyshev(Mean, Sd) UCL	955			95% Chebyshev(Mean, Sd) UCL	1096		
427					97.5% Chebyshev(Mean, Sd) UCL	1292			99% Chebyshev(Mean, Sd) UCL	1676		
428					Suggested UCL to Use							
429					95% Student's-t UCL	821.2						
430					When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test							
431					When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL							
432												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
433	Mercury																		
434	General Statistics																		
435	Total Number of Observations			32	Number of Distinct Observations			32											
436					Number of Missing Observations			0											
437	Minimum			0.0342					Mean			1.121							
438	Maximum			8.97					Median			0.291							
439	SD			2.123					Std. Error of Mean			0.375							
440	Coefficient of Variation			1.894					Skewness			2.818							
441	Normal GOF Test																		
442	Shapiro Wilk Test Statistic			0.538	Shapiro Wilk GOF Test														
443	5% Shapiro Wilk Critical Value			0.93	Data Not Normal at 5% Significance Level														
444	Lilliefors Test Statistic			0.351	Lilliefors GOF Test														
445	5% Lilliefors Critical Value			0.154	Data Not Normal at 5% Significance Level														
446	Data Not Normal at 5% Significance Level																		
447	Assuming Normal Distribution																		
448	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
449	95% Student's-t UCL			1.757	95% Adjusted-CLT UCL (Chen-1995)			1.938											
450					95% Modified-t UCL (Johnson-1978)			1.788											
451	Gamma GOF Test																		
452	A-D Test Statistic			2.084	Anderson-Darling Gamma GOF Test														
453	5% A-D Critical Value			0.805	Data Not Gamma Distributed at 5% Significance Level														
454	K-S Test Statistic			0.242	Kolmogorov-Smirnov Gamma GOF Test														
455	5% K-S Critical Value			0.164	Data Not Gamma Distributed at 5% Significance Level														
456	Data Not Gamma Distributed at 5% Significance Level																		
457	Gamma Statistics																		
458	k hat (MLE)			0.56	k star (bias corrected MLE)			0.528											
459	Theta hat (MLE)			2.001	Theta star (bias corrected MLE)			2.121											
460	nu hat (MLE)			35.84	nu star (bias corrected)			33.81											
461	MLE Mean (bias corrected)			1.121	MLE Sd (bias corrected)			1.542											
462					Approximate Chi Square Value (0.05)			21.52											
463	Adjusted Level of Significance			0.0416	Adjusted Chi Square Value			20.99											
464	Assuming Gamma Distribution																		
465	95% Approximate Gamma UCL (use when n>=50))			1.761	95% Adjusted Gamma UCL (use when n<50)			1.805											
466	Lognormal GOF Test																		
467	Shapiro Wilk Test Statistic			0.95	Shapiro Wilk Lognormal GOF Test														
468	5% Shapiro Wilk Critical Value			0.93	Data appear Lognormal at 5% Significance Level														
469	Lilliefors Test Statistic			0.131	Lilliefors Lognormal GOF Test														
470	5% Lilliefors Critical Value			0.154	Data appear Lognormal at 5% Significance Level														
471	Data appear Lognormal at 5% Significance Level																		
472	Lognormal Statistics																		
473	Minimum of Logged Data			-3.376	Mean of logged Data			-1.001											
474	Maximum of Logged Data			2.194	SD of logged Data			1.441											
475	Assuming Lognormal Distribution																		
476	95% H-UCL			2.26	90% Chebyshev (MVUE) UCL			1.915											
477	95% Chebyshev (MVUE) UCL			2.34	97.5% Chebyshev (MVUE) UCL			2.931											
478	99% Chebyshev (MVUE) UCL			4.09															
479	Nonparametric Distribution Free UCL Statistics																		
480	Data appear to follow a Discernible Distribution at 5% Significance Level																		
481	Nonparametric Distribution Free UCLs																		
482	95% CLT UCL			1.738	95% Jackknife UCL			1.757											
483	95% Standard Bootstrap UCL			1.739	95% Bootstrap-t UCL			2.326											
484	95% Hall's Bootstrap UCL			2.092	95% Percentile Bootstrap UCL			1.782											
485	95% BCA Bootstrap UCL			1.913															
486	90% Chebyshev(Mean, Sd) UCL			2.247	95% Chebyshev(Mean, Sd) UCL			2.757											
487	97.5% Chebyshev(Mean, Sd) UCL			3.464	99% Chebyshev(Mean, Sd) UCL			4.855											
488	Suggested UCL to Use																		
489	95% H-UCL			2.26															
490	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.																		
491	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.																		
492	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.																		
493	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.																		
494																			

**North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L										
495					UCL Statistics for Data Sets with Non-Detects																	
496		User Selected Options	North Pit 0-0.5 feet bgs with NonDetects																			
497		Date/Time of Computation	ProUCL 5.112/15/2017 11:19:32 AM																			
498		From File	171215 Summary Tables Soil Statistics_a.xls																			
499		Full Precision	OFF																			
500		Confidence Coefficient	95%																			
501		Number of Bootstrap Operations	2000																			
502																						

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
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North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L						
565	95% Gamma Approximate KM-UCL (use when n>=50)				3.894		95% Gamma Adjusted KM-UCL (use when n<50)					4.035						
Lognormal GOF Test on Detected Observations Only																		
567	Shapiro Wilk Test Statistic			0.843			Shapiro Wilk GOF Test											
568	5% Shapiro Wilk Critical Value			0.905			Detected Data Not Lognormal at 5% Significance Level											
569	Lilliefors Test Statistic			0.231			Lilliefors GOF Test											
570	5% Lilliefors Critical Value			0.192			Detected Data Not Lognormal at 5% Significance Level											
571	Detected Data Not Lognormal at 5% Significance Level																	
572	Lognormal ROS Statistics Using Imputed Non-Detects																	
573	Mean in Original Scale			2.336			Mean in Log Scale			0.00693								
574	SD in Original Scale			3.092			SD in Log Scale			1.35								
575	95% t UCL (assumes normality of ROS data)			3.394			95% Percentile Bootstrap UCL			3.333								
576	95% BCA Bootstrap UCL			3.569			95% Bootstrap t UCL			3.779								
577	95% H-UCL (Log ROS)			5.685														
578	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																	
579	KM Mean (logged)			0.0421			KM Geo Mean			1.043								
580	KM SD (logged)			1.258			95% Critical H Value (KM-Log)			2.841								
581	KM Standard Error of Mean (logged)			0.263			95% H-UCL (KM -Log)			4.772								
582	KM SD (logged)			1.258			95% Critical H Value (KM-Log)			2.841								
583	KM Standard Error of Mean (logged)			0.263														
584	DL/2 Statistics																	
585	DL/2 Normal				DL/2 Log-Transformed													
586	Mean in Original Scale			2.454			Mean in Log Scale			0.173								
587	SD in Original Scale			3.032			SD in Log Scale			1.26								
588	95% t UCL (Assumes normality)			3.492			95% H-Stat UCL			5.46								
589	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
590	Nonparametric Distribution Free UCL Statistics																	
591	Data do not follow a Discernible Distribution at 5% Significance Level																	
592	Suggested UCL to Use																	
593	95% KM (Chebyshev) UCL			5.068														
594																		

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
Cyanide																			
General Statistics																			
597	Total Number of Observations			25	Number of Distinct Observations			18											
598					Number of Missing Observations			4											
599	Number of Detects			9	Number of Non-Detects			16											
600	Number of Distinct Detects			9	Number of Distinct Non-Detects			9											
601	Minimum Detect			0.715	Minimum Non-Detect			0.58											
602	Maximum Detect			34.3	Maximum Non-Detect			0.69											
603	Variance Detects			114.6	Percent Non-Detects			64%											
604	Mean Detects			9.04	SD Detects			10.7											
605	Median Detects			3.94	CV Detects			1.184											
606	Skewness Detects			1.906	Kurtosis Detects			4.021											
607	Mean of Logged Detects			1.545	SD of Logged Detects			1.295											
608	Normal GOF Test on Detects Only																		
609	Shapiro Wilk Test Statistic			0.771	Shapiro Wilk GOF Test														
610	5% Shapiro Wilk Critical Value			0.829	Detected Data Not Normal at 5% Significance Level														
611	Lilliefors Test Statistic			0.239	Lilliefors GOF Test														
612	5% Lilliefors Critical Value			0.274	Detected Data appear Normal at 5% Significance Level														
613	Detected Data appear Approximate Normal at 5% Significance Level																		
614	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																		
615	KM Mean			3.625	KM Standard Error of Mean			1.547											
616	KM SD			7.291	95% KM (BCA) UCL			6.534											
617	95% KM (t) UCL			6.272	95% KM (Percentile Bootstrap) UCL			6.396											
618	95% KM (z) UCL			6.169	95% KM Bootstrap t UCL			9.141											
619	90% KM Chebyshev UCL			8.265	95% KM Chebyshev UCL			10.37											
620	97.5% KM Chebyshev UCL			13.28	99% KM Chebyshev UCL			19.01											
621	Gamma GOF Tests on Detected Observations Only																		
622	A-D Test Statistic			0.292	Anderson-Darling GOF Test														
623	5% A-D Critical Value			0.747	Detected data appear Gamma Distributed at 5% Significance Level														
624	K-S Test Statistic			0.179	Kolmogorov-Smirnov GOF														
625	5% K-S Critical Value			0.288	Detected data appear Gamma Distributed at 5% Significance Level														
626	Detected data appear Gamma Distributed at 5% Significance Level																		
627	Gamma Statistics on Detected Data Only																		
628	k hat (MLE)			0.892	k star (bias corrected MLE)			0.669											
629	Theta hat (MLE)			10.14	Theta star (bias corrected MLE)			13.52											
630	nu hat (MLE)			16.05	nu star (bias corrected)			12.03											
631	Mean (detects)			9.04															
632	Gamma ROS Statistics using Imputed Non-Detects																		
633	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																		
634	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																		
635	For such situations, GROS method may yield incorrect values of UCLs and BTVs																		
636	This is especially true when the sample size is small.																		
637	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																		
638	Minimum			0.01	Mean			3.261											
639	Maximum			34.3	Median			0.01											
640	SD			7.6	CV			2.331											
641	k hat (MLE)			0.205	k star (bias corrected MLE)			0.207											
642	Theta hat (MLE)			15.89	Theta star (bias corrected MLE)			15.74											
643	nu hat (MLE)			10.26	nu star (bias corrected)			10.36											
644	Adjusted Level of Significance (β)			0.0395															
645	Approximate Chi Square Value (10.36, α)			4.168	Adjusted Chi Square Value (10.36, β)			3.903											
646	95% Gamma Approximate UCL (use when n>=50)			8.105	95% Gamma Adjusted UCL (use when n<50)			8.655											
647	Estimates of Gamma Parameters using KM Estimates																		
648	Mean (KM)			3.625	SD (KM)			7.291											
649	Variance (KM)			53.16	SE of Mean (KM)			1.547											
650	k hat (KM)			0.247	k star (KM)			0.244											
651	nu hat (KM)			12.36	nu star (KM)			12.21											
652	theta hat (KM)			14.66	theta star (KM)			14.84											
653	80% gamma percentile (KM)			5.221	90% gamma percentile (KM)			10.9											
654	95% gamma percentile (KM)			17.67	99% gamma percentile (KM)			35.75											
655	Gamma Kaplan-Meier (KM) Statistics																		
656	Approximate Chi Square Value (12.21, α)			5.368	Adjusted Chi Square Value (12.21, β)			5.06											

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
657	95% Gamma Approximate KM-UCL (use when n>=50)				8.249		95% Gamma Adjusted KM-UCL (use when n<50)					8.75
Lognormal GOF Test on Detected Observations Only												
659	Shapiro Wilk Test Statistic				0.957							Shapiro Wilk GOF Test
660	5% Shapiro Wilk Critical Value				0.829		Detected Data appear Lognormal at 5% Significance Level					
661	Lilliefors Test Statistic				0.182							Lilliefors GOF Test
662	5% Lilliefors Critical Value				0.274		Detected Data appear Lognormal at 5% Significance Level					
663	Detected Data appear Lognormal at 5% Significance Level											
664	Lognormal ROS Statistics Using Imputed Non-Detects											
665	Mean in Original Scale				3.316						Mean in Log Scale	-1.138
666	SD in Original Scale				7.576						SD in Log Scale	2.289
667	95% t UCL (assumes normality of ROS data)				5.908						95% Percentile Bootstrap UCL	5.95
668	95% BCA Bootstrap UCL				7.124						95% Bootstrap t UCL	8.951
669	95% H-UCL (Log ROS)				35.16							
670	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
671	KM Mean (logged)				0.208						KM Geo Mean	1.231
672	KM SD (logged)				1.242						95% Critical H Value (KM-Log)	2.819
673	KM Standard Error of Mean (logged)				0.264						95% H-UCL (KM -Log)	5.441
674	KM SD (logged)				1.242						95% Critical H Value (KM-Log)	2.819
675	KM Standard Error of Mean (logged)				0.264							
676	DL/2 Statistics											
677	DL/2 Normal				DL/2 Log-Transformed							
678	Mean in Original Scale				3.457						Mean in Log Scale	-0.18
679	SD in Original Scale				7.514						SD in Log Scale	1.518
680	95% t UCL (Assumes normality)				6.028						95% H-Stat UCL	7.178
681	DL/2 is not a recommended method, provided for comparisons and historical reasons											
682	Nonparametric Distribution Free UCL Statistics											
683	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
684	Suggested UCL to Use											
685	95% KM (t) UCL				6.272							
686	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
687	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
688												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
767	Bis(2-Ethylhexyl) Phthalate											
768	General Statistics											
769	Total Number of Observations 25 Number of Distinct Observations 23 Number of Missing Observations 4											
770	Number of Detects 3 Number of Non-Detects 22 Number of Distinct Detects 3 Number of Distinct Non-Detects 20											
771	Minimum Detect 0.011 Minimum Non-Detect 0.0069 Maximum Detect 84 Maximum Non-Detect 0.37											
772	Variance Detects 2349 Percent Non-Detects 88% Mean Detects 28.03 SD Detects 48.47											
773	Median Detects 0.09 CV Detects 1.729 Skewness Detects 1.732 Kurtosis Detects N/A											
774	Mean of Logged Detects -0.829 SD of Logged Detects 4.675											
775	Warning: Data set has only 3 Detected Values.											
776	This is not enough to compute meaningful or reliable statistics and estimates.											
777	Normal GOF Test on Detects Only											
778	Shapiro Wilk Test Statistic 0.751 Shapiro Wilk GOF Test 5% Shapiro Wilk Critical Value 0.767 Detected Data Not Normal at 5% Significance Level											
779	Lilliefors Test Statistic 0.385 Lilliefors GOF Test 5% Lilliefors Critical Value 0.425 Detected Data appear Normal at 5% Significance Level											
780	Detected Data appear Approximate Normal at 5% Significance Level											
781	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
782	KM Mean 3.373 KM Standard Error of Mean 4.031 KM SD 16.46 95% KM (BCA) UCL N/A											
783	95% KM (t) UCL 10.27 95% KM (Percentile Bootstrap) UCL N/A 95% KM (z) UCL 10 95% KM Bootstrap t UCL N/A											
784	90% KM Chebyshev UCL 15.47 95% KM Chebyshev UCL 20.95 97.5% KM Chebyshev UCL 28.55 99% KM Chebyshev UCL 43.48											
785	Gamma GOF Tests on Detected Observations Only											
786	Not Enough Data to Perform GOF Test											
787	Gamma Statistics on Detected Data Only											
788	k hat (MLE) 0.18 k star (bias corrected MLE) N/A Theta hat (MLE) 156 Theta star (bias corrected MLE) N/A nu hat (MLE) 1.078 nu star (bias corrected) N/A Mean (detects) 28.03											
789	Gamma ROS Statistics using Imputed Non-Detects											
790	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
791	For such situations, GROS method may yield incorrect values of UCLs and BTVs This is especially true when the sample size is small.											
792	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
793	Minimum 0.01 Mean 3.373 Maximum 84 Median 0.01 SD 16.8 CV 4.98											
794	k hat (MLE) 0.144 k star (bias corrected MLE) 0.153 Theta hat (MLE) 23.42 Theta star (bias corrected MLE) 21.99 nu hat (MLE) 7.201 nu star (bias corrected) 7.671											
795	Adjusted Level of Significance (β) 0.0395 Approximate Chi Square Value (7.67, α) 2.546 Adjusted Chi Square Value (7.67, β) 2.349											
796	95% Gamma Approximate UCL (use when n>=50) 10.16 95% Gamma Adjusted UCL (use when n<50) N/A											
797	Estimates of Gamma Parameters using KM Estimates											
798	Mean (KM) 3.373 SD (KM) 16.46 Variance (KM) 270.9 SE of Mean (KM) 4.031 k hat (KM) 0.042 k star (KM) 0.0636 nu hat (KM) 2.1 nu star (KM) 3.181 theta hat (KM) 80.31 theta star (KM) 53.01											
799	80% gamma percentile (KM) 0.955 90% gamma percentile (KM) 6.711 95% gamma percentile (KM) 19.13 99% gamma percentile (KM) 66.33											
800	Gamma Kaplan-Meier (KM) Statistics											
801	Approximate Chi Square Value (3.18, α) 0.428 Adjusted Chi Square Value (3.18, β) 0.371 95% Gamma Approximate KM-UCL (use when n>=50) 25.06 95% Gamma Adjusted KM-UCL (use when n<50) 28.94 95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)											

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
829	Lognormal GOF Test on Detected Observations Only											
830				Shapiro Wilk Test Statistic	0.914							Shapiro Wilk GOF Test
831				5% Shapiro Wilk Critical Value	0.767							Detected Data appear Lognormal at 5% Significance Level
832				Lilliefors Test Statistic	0.299							Lilliefors GOF Test
833				5% Lilliefors Critical Value	0.425							Detected Data appear Lognormal at 5% Significance Level
834	Detected Data appear Lognormal at 5% Significance Level											
835	Lognormal ROS Statistics Using Imputed Non-Detects											
836				Mean in Original Scale	3.364							Mean in Log Scale -10.46
837				SD in Original Scale	16.8							SD in Log Scale 4.123
838				95% t UCL (assumes normality of ROS data)	9.112							95% Percentile Bootstrap UCL 10.08
839				95% BCA Bootstrap UCL	16.8							95% Bootstrap t UCL 25776
840				95% H-UCL (Log ROS)	84.05							
841	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
842				KM Mean (logged)	-4.331							KM Geo Mean 0.0132
843				KM SD (logged)	1.896							95% Critical H Value (KM-Log) 3.81
844				KM Standard Error of Mean (logged)	0.489							95% H-UCL (KM -Log) 0.347
845				KM SD (logged)	1.896							95% Critical H Value (KM-Log) 3.81
846				KM Standard Error of Mean (logged)	0.489							
847	DL/2 Statistics											
848	DL/2 Normal					DL/2 Log-Transformed						
849				Mean in Original Scale	3.411							Mean in Log Scale -3.164
850				SD in Original Scale	16.79							SD in Log Scale 1.978
851				95% t UCL (Assumes normality)	9.156							95% H-Stat UCL 1.466
852	DL/2 is not a recommended method, provided for comparisons and historical reasons											
853	Nonparametric Distribution Free UCL Statistics											
854	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
855	Suggested UCL to Use											
856				95% KM (t) UCL	10.27							
857	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
858	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
859												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L								
860	High Molecular Weight PAHs																			
861	General Statistics																			
862	Total Number of Observations		25			Number of Distinct Observations		25												
863								Number of Missing Observations	4											
864	Number of Detects		24					Number of Non-Detects	1											
865	Number of Distinct Detects		24					Number of Distinct Non-Detects	1											
866	Minimum Detect		0.0833					Minimum Non-Detect	0.0158											
867	Maximum Detect		2.583					Maximum Non-Detect	0.0158											
868	Variance Detects		0.485					Percent Non-Detects	4%											
869	Mean Detects		0.687					SD Detects	0.697											
870	Median Detects		0.357					CV Detects	1.014											
871	Skewness Detects		1.506					Kurtosis Detects	1.432											
872	Mean of Logged Detects		-0.818					SD of Logged Detects	0.951											
873	Normal GOF Test on Detects Only																			
874	Shapiro Wilk Test Statistic		0.78			Shapiro Wilk GOF Test														
875	5% Shapiro Wilk Critical Value		0.916			Detected Data Not Normal at 5% Significance Level														
876	Lilliefors Test Statistic		0.257			Lilliefors GOF Test														
877	5% Lilliefors Critical Value		0.177			Detected Data Not Normal at 5% Significance Level														
878	Detected Data Not Normal at 5% Significance Level																			
879	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																			
880	KM Mean		0.66			KM Standard Error of Mean		0.139												
881	KM SD		0.681			95% KM (BCA) UCL		0.904												
882	95% KM (t) UCL		0.898			95% KM (Percentile Bootstrap) UCL		0.885												
883	95% KM (z) UCL		0.889			95% KM Bootstrap t UCL		0.969												
884	90% KM Chebyshev UCL		1.078			95% KM Chebyshev UCL		1.267												
885	97.5% KM Chebyshev UCL		1.529			99% KM Chebyshev UCL		2.045												
886	Gamma GOF Tests on Detected Observations Only																			
887	A-D Test Statistic		0.926			Anderson-Darling GOF Test														
888	5% A-D Critical Value		0.766			Detected Data Not Gamma Distributed at 5% Significance Level														
889	K-S Test Statistic		0.202			Kolmogorov-Smirnov GOF														
890	5% K-S Critical Value		0.182			Detected Data Not Gamma Distributed at 5% Significance Level														
891	Detected Data Not Gamma Distributed at 5% Significance Level																			
892	Gamma Statistics on Detected Data Only																			
893	k hat (MLE)		1.27			k star (bias corrected MLE)		1.139												
894	Theta hat (MLE)		0.541			Theta star (bias corrected MLE)		0.603												
895	nu hat (MLE)		60.96			nu star (bias corrected)		54.68												
896	Mean (detects)		0.687																	
897	Gamma ROS Statistics using Imputed Non-Detects																			
898	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																			
899	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																			
900	For such situations, GROS method may yield incorrect values of UCLs and BTVs																			
901	This is especially true when the sample size is small.																			
902	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																			
903	Minimum		0.01					Mean	0.66											
904	Maximum		2.583					Median	0.343											
905	SD		0.695					CV	1.053											
906	k hat (MLE)		1.037			k star (bias corrected MLE)		0.94												
907	Theta hat (MLE)		0.636			Theta star (bias corrected MLE)		0.703												
908	nu hat (MLE)		51.87			nu star (bias corrected)		46.98												
909	Adjusted Level of Significance (β)		0.0395																	
910	Approximate Chi Square Value (46.98, α)		32.25			Adjusted Chi Square Value (46.98, β)		31.42												
911	95% Gamma Approximate UCL (use when $n \geq 50$)		0.962			95% Gamma Adjusted UCL (use when $n < 50$)		0.987												
912	Estimates of Gamma Parameters using KM Estimates																			
913	Mean (KM)		0.66					SD (KM)	0.681											
914	Variance (KM)		0.464					SE of Mean (KM)	0.139											
915	k hat (KM)		0.94					k star (KM)	0.854											
916	nu hat (KM)		47.02					nu star (KM)	42.71											
917	theta hat (KM)		0.702					theta star (KM)	0.773											
918	80% gamma percentile (KM)		1.075					90% gamma percentile (KM)	1.581											
919	95% gamma percentile (KM)		2.093					99% gamma percentile (KM)	3.296											
920	Gamma Kaplan-Meier (KM) Statistics																			
921	Approximate Chi Square Value (42.71, α)		28.72			Adjusted Chi Square Value (42.71, β)		27.94												

North Pit Soils 0 - 0.5-feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
922	95% Gamma Approximate KM-UCL (use when n>=50)		0.982			95% Gamma Adjusted KM-UCL (use when n<50)					1.009	
Lognormal GOF Test on Detected Observations Only												
924	Shapiro Wilk Test Statistic		0.95									Shapiro Wilk GOF Test
925	5% Shapiro Wilk Critical Value		0.916			Detected Data appear Lognormal at 5% Significance Level						
926	Lilliefors Test Statistic		0.148									Lilliefors GOF Test
927	5% Lilliefors Critical Value		0.177			Detected Data appear Lognormal at 5% Significance Level						
928	Detected Data appear Lognormal at 5% Significance Level											
929	Lognormal ROS Statistics Using Imputed Non-Detects											
930	Mean in Original Scale		0.661									Mean in Log Scale -0.912
931	SD in Original Scale		0.694									SD in Log Scale 1.044
932	95% t UCL (assumes normality of ROS data)		0.899									95% Percentile Bootstrap UCL 0.898
933	95% BCA Bootstrap UCL		0.91									95% Bootstrap t UCL 0.969
934	95% H-UCL (Log ROS)		1.193									
935	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
936	KM Mean (logged)		-0.951									KM Geo Mean 0.386
937	KM SD (logged)		1.121									95% Critical H Value (KM-Log) 2.653
938	KM Standard Error of Mean (logged)		0.229									95% H-UCL (KM -Log) 1.33
939	KM SD (logged)		1.121									95% Critical H Value (KM-Log) 2.653
940	KM Standard Error of Mean (logged)		0.229									
941	DL/2 Statistics											
942	DL/2 Normal				DL/2 Log-Transformed							
943	Mean in Original Scale		0.66									Mean in Log Scale -0.979
944	SD in Original Scale		0.695									SD in Log Scale 1.23
945	95% t UCL (Assumes normality)		0.898									95% H-Stat UCL 1.619
946	DL/2 is not a recommended method, provided for comparisons and historical reasons											
947	Nonparametric Distribution Free UCL Statistics											
948	Detected Data appear Lognormal Distributed at 5% Significance Level											
949	Suggested UCL to Use											
950	KM H-UCL		1.33									

**1 - 2 feet bgs Soil Analytical Data Summary North Area
Brine Service Company Superfund Site**

Location	Depth	Barium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	D_Selenium	Zinc	Mercury	Cyanide	D_Cyanide	BEP	D_BEP	HMWPAH	D_HMWPAH
ENSB01	1-2 ft	1.88E+02	2.96E-01	5.40E+00	5.11E+00	1.09E+01	6.65E+00	1.12E+00	1	2.29E+01	9.90E-01	6.70E-01	0	7.90E-03	0	9.03E-01	1
ENSB02	1-2 ft	2.89E+02	1.59E-01	5.60E+00	5.05E+00	8.46E+00	5.74E+00	8.32E-01	1	1.70E+01	4.26E-02	7.10E-01	0	8.00E-03	0	1.78E-02	0
ENSB03	1-2 ft	1.00E+02	1.47E-01	5.08E+00	4.32E+00	7.02E+00	5.57E+00	8.54E-01	1	1.60E+01	1.40E-02	6.50E-01	0	7.60E-03	0	1.67E-02	0
ENSB04	1-2 ft	9.41E+02	1.13E+00	1.45E+01	1.14E+01	5.50E+01	6.52E+00	1.30E+00	0	1.45E+02	2.19E+01	6.40E-01	0	1.70E-02	0	2.11E-01	1
ENSB05	1-2 ft	6.19E+02	1.50E+00	6.69E+00	1.04E+01	2.21E+01	5.80E+00	1.42E+00	1	1.60E+02	2.31E+01	6.90E-01	0	7.90E-03	0	3.73E-01	1
ENSB06	1-2 ft	2.92E+03	5.44E+00	5.13E+00	1.74E+01	7.16E+01	5.57E+00	1.22E+00	1	6.88E+02	3.45E+00	6.70E-01	0	3.30E-02	1	1.34E-01	1
ENSB07	1-2 ft	2.89E+02	1.20E+01	8.44E+00	5.77E+01	1.55E+02	7.04E+00	1.28E+01	1	1.57E+03	7.90E+00	6.80E-01	0	1.00E-02	1	6.36E-01	1
ENSB08	1-2 ft	1.07E+02	1.26E-01	2.67E+00	3.13E+00	1.15E+01	3.25E+00	6.25E-01	1	1.09E+01	5.85E-03	7.00E-01	0	9.10E-03	1	2.95E+00	1
ENSB09	1-2 ft	1.58E+02	3.72E+00	3.67E+00	2.99E+01	1.41E+02	3.59E+00	6.74E+00	1	3.94E+02	1.39E+01	6.80E-01	0	8.70E-03	1	2.83E-01	1
ENSB09	1-2 ft	2.83E+02	2.74E+00	4.47E+00	1.34E+01	4.93E+01	4.46E+00	2.67E+00	1	4.04E+02	3.11E+01	6.80E-01	0	2.60E-02	1	1.30E-01	1
ENSB10	1-2 ft									1.67E-02							
ENSB11	1-2 ft									1.33E-02							
ENSB12	1-2 ft									3.47E+00							
ENSB13	1-2 ft									3.65E-02							
ENSB14	1-2 ft									4.14E-03							
ENSB15	1-2 ft									2.26E-03							
ENSB16	1-2 ft									2.43E-02							
ENSB17	1-2 ft									9.85E-03							
ESSB09	1-2 ft	2.00E+02	2.63E+01	8.51E+00	8.26E+01	2.27E+02	7.82E+00	8.46E+00	1	2.16E+03	5.81E+01	6.60E-01	0	4.30E-03	0	1.08E-01	1
NPSB01	1-2 ft	4.17E+02	2.29E-01	6.78E+00	6.37E+00	1.23E+01	5.82E+00	1.09E+00	1	3.72E+01	4.52E-02	7.20E-01	0	8.00E-03	0	2.48E-02	1
NPSB02	1-2 ft	1.60E+02	2.39E-01	7.03E+00	5.61E+00	1.00E+01	6.66E+00	9.95E-01	1	3.90E+01	3.52E-02	6.70E-01	0	9.60E-03	1	3.82E-02	1
NPSB03	1-2 ft	3.37E+02	3.26E+01	8.64E+00	5.77E+01	3.75E+02	1.06E+01	4.27E+00	1	1.50E+03	1.66E+00	7.20E-01	0	8.00E-03	0	2.48E-02	1
NPSB04	1-2 ft	2.70E+02	4.28E-01	6.27E+00	6.31E+00	9.07E+00	6.59E+00	1.36E+00	1	3.12E+01	1.52E-01	6.90E-01	0	7.60E-03	0	1.55E-01	1
NPSB04	1-2 ft	2.40E+02	1.37E+00	6.16E+00	7.41E+00	1.89E+01	6.28E+00	1.47E+00	1	6.45E+01	1.49E-01	6.90E-01	0	9.70E-03	0	8.04E-02	1
NPSB05	1-2 ft	2.44E+02	2.60E+01	8.31E+00	8.42E+01	1.68E+02	7.10E+00	3.15E+00	1	2.52E+03	7.85E+00	6.80E-01	0	9.40E-03	1	8.33E-01	1
NPSB06	1-2 ft	2.81E+02	9.33E+00	6.89E+00	1.50E+01	5.23E+01	6.65E+00	2.32E+00	1	4.85E+02	5.93E-01	7.20E-01	0	8.40E-03	0	1.14E-01	1
NPSB07	1-2 ft	3.11E+02	6.72E+01	6.42E+00	4.75E+02	8.58E+02	7.26E+00	5.06E+00	1	1.37E+04	8.30E+00	7.30E-01	0	1.40E-02	1	5.48E-01	1
NPSB08	1-2 ft	1.07E+03	5.94E+00	8.18E+00	2.89E+01	9.27E+01	6.24E+00	3.75E+00	1	9.69E+02	4.42E+00	6.70E-01	0	7.50E-03	0	5.82E-02	1
NPSB09	1-2 ft	2.83E+02	3.74E+01	8.02E+00	6.69E+01	1.83E+02	6.70E+00	3.89E+00	1	1.84E+03	1.10E+01	6.70E-01	0	8.40E-03	0	2.91E-01	1
NPSB10	1-2 ft	4.23E+02	2.38E+01	1.22E+01	5.45E+01	1.10E+02	7.24E+00	3.27E+00	1	1.11E+03	1.32E+01	6.90E-01	0	6.10E-02	1	2.45E-01	1
NPSB11	1-2 ft	1.79E+02	4.23E-01	6.23E+00	6.26E+00	1.43E+01	5.91E+00	1.35E+00	1	2.82E+01	5.80E-01	6.90E-01	0	1.40E-02	0	5.38E-02	1
NPSB12	1-2 ft	1.86E+02	4.09E-01	6.48E+00	1.53E+01	6.16E+01	6.17E+00	3.64E-01	0	5.13E+01	3.83E-02	6.50E-01	0	2.50E-02	0	5.96E-01	1
WSB05	1-2 ft	2.59E+02	2.37E-01	5.57E+00	6.77E+00	1.01E+01	6.70E+00	8.79E-01	1	2.54E+01	2.50E-02	2.30E+00	1	7.70E-03	0	2.43E-02	1
WSB06	1-2 ft	2.74E+02	2.09E-01	1.06E+01	7.42E+00	1.11E+01	8.73E+00	7.78E-01	1	5.43E+01	2.72E-02	7.20E-01	0	8.00E-03	0	2.16E-02	1
WSB07	1-2 ft	2.11E+02	3.19E+01	8.81E+00	1.06E+02	2.09E+02	7.00E+00	3.28E+00	1	2.28E+03	3.68E+00	7.10E-01	0	1.10E-02	1	1.59E+00	1
WSB08	1-2 ft	2.56E+02	1.79E-01	3.92E+00	5.37E+00	8.48E+00	3.37E+00	4.46E-01	1	6.89E+01	4.61E-02	6.70E-01	0	1.60E-02	1	7.64E-01	1
WSB08	1-2 ft	2.86E+02	1.54E-01	3.12E+00	3.84E+00	8.06E+00	3.11E+00	8.61E-01	1	6.19E+01	3.93E-02	6.70E-01	0	1.30E-02	1	4.76E-01	1
WSB10	1-2 ft									4.72E-03							
WSB11	1-2 ft									9.14E-03							

Max	2.92E+03	6.72E+01	1.45E+01	4.75E+02	8.58E+02	1.06E+01	1.28E+01		1.37E+04	5.81E+01	2.30E+00		6.10E-02		2.95E+00	
Min	1.00E+02	1.26E-01	2.67E+00	3.13E+00	7.02E+00	3.11E+00	3.64E-01		1.09E+01	2.26E-03	6.40E-01		4.30E-03	</		

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L	
1					UCL Statistics for Uncensored Full Data Sets								
2			User Selected Options		North Pit 1-2 feet bgs								
3			Date/Time of Computation		ProUCL 5.112/15/2017 2:06:41 PM								
4			From File		171215 Summary Tables Soil Statistics_b.xls								
5			Full Precision		OFF								
6			Confidence Coefficient		95%								
7			Number of Bootstrap Operations		2000								
8													

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L						
9	Barium																	
10	General Statistics																	
11	Total Number of Observations				29	Number of Distinct Observations				27								
12						Number of Missing Observations				9								
13	Minimum				100	Mean				406.2								
14	Maximum				2920	Median				274								
15	SD				529.9	Std. Error of Mean				98.39								
16	Coefficient of Variation				1.304	Skewness				4.17								
17	Normal GOF Test																	
18	Shapiro Wilk Test Statistic				0.471	Shapiro Wilk GOF Test												
19	5% Shapiro Wilk Critical Value				0.926	Data Not Normal at 5% Significance Level												
20	Lilliefors Test Statistic				0.349	Lilliefors GOF Test												
21	5% Lilliefors Critical Value				0.161	Data Not Normal at 5% Significance Level												
22	Data Not Normal at 5% Significance Level																	
23	Assuming Normal Distribution																	
24	95% Normal UCL					95% UCLs (Adjusted for Skewness)												
25	95% Student's-t UCL				573.6	95% Adjusted-CLT UCL (Chen-1995)				649.5								
26						95% Modified-t UCL (Johnson-1978)				586.3								
27	Gamma GOF Test																	
28	A-D Test Statistic				2.759	Anderson-Darling Gamma GOF Test												
29	5% A-D Critical Value				0.761	Data Not Gamma Distributed at 5% Significance Level												
30	K-S Test Statistic				0.286	Kolmogorov-Smirnov Gamma GOF Test												
31	5% K-S Critical Value				0.165	Data Not Gamma Distributed at 5% Significance Level												
32	Data Not Gamma Distributed at 5% Significance Level																	
33	Gamma Statistics																	
34	k hat (MLE)				1.689	k star (bias corrected MLE)				1.537								
35	Theta hat (MLE)				240.5	Theta star (bias corrected MLE)				264.3								
36	nu hat (MLE)				97.96	nu star (bias corrected)				89.16								
37	MLE Mean (bias corrected)				406.2	MLE Sd (bias corrected)				327.7								
38	Approximate Chi Square Value (0.05)																	
39	Adjusted Level of Significance				0.0407	Adjusted Chi Square Value				67.3								
40	Assuming Gamma Distribution																	
41	95% Approximate Gamma UCL (use when n>=50)				529.6	95% Adjusted Gamma UCL (use when n<50)				538.2								
42	Lognormal GOF Test																	
43	Shapiro Wilk Test Statistic				0.86	Shapiro Wilk Lognormal GOF Test												
44	5% Shapiro Wilk Critical Value				0.926	Data Not Lognormal at 5% Significance Level												
45	Lilliefors Test Statistic				0.234	Lilliefors Lognormal GOF Test												
46	5% Lilliefors Critical Value				0.161	Data Not Lognormal at 5% Significance Level												
47	Data Not Lognormal at 5% Significance Level																	
48	Lognormal Statistics																	
49	Minimum of Logged Data				4.605	Mean of logged Data				5.683								
50	Maximum of Logged Data				7.979	SD of logged Data				0.684								
51	Assuming Lognormal Distribution																	
52	95% H-UCL				487.8	90% Chebyshev (MVUE) UCL				518.5								
53	95% Chebyshev (MVUE) UCL				586.9	97.5% Chebyshev (MVUE) UCL				681.8								
54	99% Chebyshev (MVUE) UCL				868.2													
55	Nonparametric Distribution Free UCL Statistics																	
56	Data do not follow a Discernible Distribution (0.05)																	
57	Nonparametric Distribution Free UCLs																	
58	95% CLT UCL				568.1	95% Jackknife UCL				573.6								
59	95% Standard Bootstrap UCL				567.3	95% Bootstrap-t UCL				856.3								
60	95% Hall's Bootstrap UCL				1108	95% Percentile Bootstrap UCL				584								
61	95% BCA Bootstrap UCL				702.4													
62	90% Chebyshev(Mean, Sd) UCL				701.4	95% Chebyshev(Mean, Sd) UCL				835.1								
63	97.5% Chebyshev(Mean, Sd) UCL				1021	99% Chebyshev(Mean, Sd) UCL				1385								
64	Suggested UCL to Use																	
65	95% Chebyshev (Mean, Sd) UCL				835.1													
66																		

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
67	Cadmium											
68	General Statistics											
69	Total Number of Observations		29				Number of Distinct Observations		29			
70							Number of Missing Observations		9			
71			Minimum	0.126					Mean	10.06		
72			Maximum	67.2					Median	1.37		
73			SD	16.17					Std. Error of Mean	3.003		
74			Coefficient of Variation	1.608					Skewness	2.04		
75	Normal GOF Test											
76	Shapiro Wilk Test Statistic		0.678				Shapiro Wilk GOF Test					
77	5% Shapiro Wilk Critical Value		0.926				Data Not Normal at 5% Significance Level					
78	Lilliefors Test Statistic		0.29				Lilliefors GOF Test					
79	5% Lilliefors Critical Value		0.161				Data Not Normal at 5% Significance Level					
80	Data Not Normal at 5% Significance Level											
81	Assuming Normal Distribution											
82	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
83	95% Student's-t UCL		15.16				95% Adjusted-CLT UCL (Chen-1995)		16.21			
84							95% Modified-t UCL (Johnson-1978)		15.35			
85	Gamma GOF Test											
86	A-D Test Statistic		1.549				Anderson-Darling Gamma GOF Test					
87	5% A-D Critical Value		0.838				Data Not Gamma Distributed at 5% Significance Level					
88	K-S Test Statistic		0.216				Kolmogorov-Smirnov Gamma GOF Test					
89	5% K-S Critical Value		0.175				Data Not Gamma Distributed at 5% Significance Level					
90	Data Not Gamma Distributed at 5% Significance Level											
91	Gamma Statistics											
92	k hat (MLE)		0.382				k star (bias corrected MLE)		0.366			
93	Theta hat (MLE)		26.29				Theta star (bias corrected MLE)		27.48			
94	nu hat (MLE)		22.18				nu star (bias corrected)		21.22			
95	MLE Mean (bias corrected)		10.06				MLE Sd (bias corrected)		16.62			
96							Approximate Chi Square Value (0.05)		11.76			
97	Adjusted Level of Significance		0.0407				Adjusted Chi Square Value		11.34			
98	Assuming Gamma Distribution											
99	95% Approximate Gamma UCL (use when n>=50))		18.15				95% Adjusted Gamma UCL (use when n<50)		18.82			
100	Lognormal GOF Test											
101	Shapiro Wilk Test Statistic		0.882				Shapiro Wilk Lognormal GOF Test					
102	5% Shapiro Wilk Critical Value		0.926				Data Not Lognormal at 5% Significance Level					
103	Lilliefors Test Statistic		0.196				Lilliefors Lognormal GOF Test					
104	5% Lilliefors Critical Value		0.161				Data Not Lognormal at 5% Significance Level					
105	Data Not Lognormal at 5% Significance Level											
106	Lognormal Statistics											
107	Minimum of Logged Data		-2.071				Mean of logged Data		0.575			
108	Maximum of Logged Data		4.208				SD of logged Data		2.132			
109	Assuming Lognormal Distribution											
110	95% H-UCL		90.59				90% Chebyshev (MVUE) UCL		36.15			
111	95% Chebyshev (MVUE) UCL		46.22				97.5% Chebyshev (MVUE) UCL		60.21			
112	99% Chebyshev (MVUE) UCL		87.68									
113	Nonparametric Distribution Free UCL Statistics											
114	Data do not follow a Discernible Distribution (0.05)											
115	Nonparametric Distribution Free UCLs											
116	95% CLT UCL		14.99				95% Jackknife UCL		15.16			
117	95% Standard Bootstrap UCL		14.88				95% Bootstrap-t UCL		16.96			
118	95% Hall's Bootstrap UCL		16.99				95% Percentile Bootstrap UCL		14.98			
119	95% BCA Bootstrap UCL		16.05									
120	90% Chebyshev(Mean, Sd) UCL		19.06				95% Chebyshev(Mean, Sd) UCL		23.14			
121	97.5% Chebyshev(Mean, Sd) UCL		28.81				99% Chebyshev(Mean, Sd) UCL		39.93			
122	Suggested UCL to Use											
123	97.5% Chebyshev (Mean, Sd) UCL		28.81									
124												

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Chromium												
General Statistics												
127	Total Number of Observations		29				Number of Distinct Observations		29			
128							Number of Missing Observations		9			
129			Minimum	2.67					Mean	6.889		
130			Maximum	14.5					Median	6.48		
131			SD	2.588					Std. Error of Mean	0.481		
132			Coefficient of Variation	0.376					Skewness	0.987		
Normal GOF Test												
134	Shapiro Wilk Test Statistic	0.938					Shapiro Wilk GOF Test					
135	5% Shapiro Wilk Critical Value	0.926					Data appear Normal at 5% Significance Level					
136	Lilliefors Test Statistic	0.133					Lilliefors GOF Test					
137	5% Lilliefors Critical Value	0.161					Data appear Normal at 5% Significance Level					
Data appear Normal at 5% Significance Level												
Assuming Normal Distribution												
140	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
141	95% Student's-t UCL	7.707					95% Adjusted-CLT UCL (Chen-1995)		7.774			
142							95% Modified-t UCL (Johnson-1978)		7.721			
Gamma GOF Test												
144	A-D Test Statistic	0.276					Anderson-Darling Gamma GOF Test					
145	5% A-D Critical Value	0.747					Data appear Gamma Distributed at 5% Significance Level					
146	K-S Test Statistic	0.101					Kolmogorov-Smirnov Gamma GOF Test					
147	5% K-S Critical Value	0.163					Data appear Gamma Distributed at 5% Significance Level					
Detected data appear Gamma Distributed at 5% Significance Level												
Gamma Statistics												
150	k hat (MLE)	7.605					k star (bias corrected MLE)		6.841			
151	Theta hat (MLE)	0.906					Theta star (bias corrected MLE)		1.007			
152	nu hat (MLE)	441.1					nu star (bias corrected)		396.8			
153	MLE Mean (bias corrected)	6.889					MLE Sd (bias corrected)		2.634			
154							Approximate Chi Square Value (0.05)		351.6			
155	Adjusted Level of Significance	0.0407					Adjusted Chi Square Value		349.1			
Assuming Gamma Distribution												
157	95% Approximate Gamma UCL (use when n>=50))	7.774					95% Adjusted Gamma UCL (use when n<50)		7.831			
Lognormal GOF Test												
159	Shapiro Wilk Test Statistic	0.978					Shapiro Wilk Lognormal GOF Test					
160	5% Shapiro Wilk Critical Value	0.926					Data appear Lognormal at 5% Significance Level					
161	Lilliefors Test Statistic	0.108					Lilliefors Lognormal GOF Test					
162	5% Lilliefors Critical Value	0.161					Data appear Lognormal at 5% Significance Level					
Data appear Lognormal at 5% Significance Level												
Lognormal Statistics												
165	Minimum of Logged Data	0.982					Mean of logged Data		1.863			
166	Maximum of Logged Data	2.674					SD of logged Data		0.379			
Assuming Lognormal Distribution												
168	95% H-UCL	7.904					90% Chebyshev (MVUE) UCL		8.396			
169	95% Chebyshev (MVUE) UCL	9.073					97.5% Chebyshev (MVUE) UCL		10.01			
170	99% Chebyshev (MVUE) UCL	11.86										
Nonparametric Distribution Free UCL Statistics												
Data appear to follow a Discernible Distribution at 5% Significance Level												
Nonparametric Distribution Free UCLs												
174	95% CLT UCL	7.68					95% Jackknife UCL		7.707			
175	95% Standard Bootstrap UCL	7.661					95% Bootstrap-t UCL		7.891			
176	95% Hall's Bootstrap UCL	7.888					95% Percentile Bootstrap UCL		7.703			
177	95% BCA Bootstrap UCL	7.758										
178	90% Chebyshev(Mean, Sd) UCL	8.331					95% Chebyshev(Mean, Sd) UCL		8.984			
179	97.5% Chebyshev(Mean, Sd) UCL	9.89					99% Chebyshev(Mean, Sd) UCL		11.67			
Suggested UCL to Use												
181	95% Student's-t UCL	7.707										
182												

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Copper												
General Statistics												
183												
184												
185	Total Number of Observations				29							Number of Distinct Observations
186												9
187						Minimum	3.13					Mean
188						Maximum	475					11.4
189						SD	88.36					Median
190						Coefficient of Variation	2.137					16.41
191												Skewness
192												4.518
193												
194												
195												
196												
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240												

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
241	Lead											
242	General Statistics											
243	Total Number of Observations		29				Number of Distinct Observations		29			
244							Number of Missing Observations		9			
245			Minimum	7.02					Mean	102.4		
246			Maximum	858					Median	49.3		
247			SD	170.4					Std. Error of Mean	31.65		
248			Coefficient of Variation	1.664					Skewness	3.446		
249	Normal GOF Test											
250	Shapiro Wilk Test Statistic		0.585				Shapiro Wilk GOF Test					
251	5% Shapiro Wilk Critical Value		0.926				Data Not Normal at 5% Significance Level					
252	Lilliefors Test Statistic		0.288				Lilliefors GOF Test					
253	5% Lilliefors Critical Value		0.161				Data Not Normal at 5% Significance Level					
254	Data Not Normal at 5% Significance Level											
255	Assuming Normal Distribution											
256	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
257	95% Student's-t UCL		156.3			95% Adjusted-CLT UCL (Chen-1995)			176.1			
258						95% Modified-t UCL (Johnson-1978)			159.7			
259	Gamma GOF Test											
260	A-D Test Statistic		1.306			Anderson-Darling Gamma GOF Test						
261	5% A-D Critical Value		0.795			Data Not Gamma Distributed at 5% Significance Level						
262	K-S Test Statistic		0.188			Kolmogorov-Smirnov Gamma GOF Test						
263	5% K-S Critical Value		0.17			Data Not Gamma Distributed at 5% Significance Level						
264	Data Not Gamma Distributed at 5% Significance Level											
265	Gamma Statistics											
266	k hat (MLE)		0.646			k star (bias corrected MLE)			0.603			
267	Theta hat (MLE)		158.5			Theta star (bias corrected MLE)			170			
268	nu hat (MLE)		37.49			nu star (bias corrected)			34.95			
269	MLE Mean (bias corrected)		102.4			MLE Sd (bias corrected)			132			
270						Approximate Chi Square Value (0.05)			22.42			
271	Adjusted Level of Significance		0.0407			Adjusted Chi Square Value			21.82			
272	Assuming Gamma Distribution											
273	95% Approximate Gamma UCL (use when n>=50))		159.7			95% Adjusted Gamma UCL (use when n<50)			164			
274	Lognormal GOF Test											
275	Shapiro Wilk Test Statistic		0.902			Shapiro Wilk Lognormal GOF Test						
276	5% Shapiro Wilk Critical Value		0.926			Data Not Lognormal at 5% Significance Level						
277	Lilliefors Test Statistic		0.181			Lilliefors Lognormal GOF Test						
278	5% Lilliefors Critical Value		0.161			Data Not Lognormal at 5% Significance Level						
279	Data Not Lognormal at 5% Significance Level											
280	Lognormal Statistics											
281	Minimum of Logged Data		1.949			Mean of logged Data			3.684			
282	Maximum of Logged Data		6.755			SD of logged Data			1.403			
283	Assuming Lognormal Distribution											
284	95% H-UCL		236.2			90% Chebyshev (MVUE) UCL			196.8			
285	95% Chebyshev (MVUE) UCL		240.7			97.5% Chebyshev (MVUE) UCL			301.5			
286	99% Chebyshev (MVUE) UCL		421									
287	Nonparametric Distribution Free UCL Statistics											
288	Data do not follow a Discernible Distribution (0.05)											
289	Nonparametric Distribution Free UCLs											
290	95% CLT UCL		154.5			95% Jackknife UCL			156.3			
291	95% Standard Bootstrap UCL		154.2			95% Bootstrap-t UCL			214.9			
292	95% Hall's Bootstrap UCL		380.3			95% Percentile Bootstrap UCL			157.8			
293	95% BCA Bootstrap UCL		178.3									
294	90% Chebyshev(Mean, Sd) UCL		197.4			95% Chebyshev(Mean, Sd) UCL			240.4			
295	97.5% Chebyshev(Mean, Sd) UCL		300.1			99% Chebyshev(Mean, Sd) UCL			417.3			
296	Suggested UCL to Use											
297	95% Chebyshev (Mean, Sd) UCL		240.4									
298												

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
299	Nickel											
300	General Statistics											
301	Total Number of Observations		29				Number of Distinct Observations		26			
302							Number of Missing Observations		9			
303			Minimum	3.11					Mean	6.212		
304			Maximum	10.6					Median	6.52		
305			SD	1.599					Std. Error of Mean	0.297		
306			Coefficient of Variation	0.257					Skewness	0.0586		
307	Normal GOF Test											
308	Shapiro Wilk Test Statistic		0.919				Shapiro Wilk GOF Test					
309	5% Shapiro Wilk Critical Value		0.926				Data Not Normal at 5% Significance Level					
310	Lilliefors Test Statistic		0.172				Lilliefors GOF Test					
311	5% Lilliefors Critical Value		0.161				Data Not Normal at 5% Significance Level					
312	Data Not Normal at 5% Significance Level											
313	Assuming Normal Distribution											
314	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
315	95% Student's-t UCL		6.717				95% Adjusted-CLT UCL (Chen-1995)		6.704			
316							95% Modified-t UCL (Johnson-1978)		6.717			
317	Gamma GOF Test											
318	A-D Test Statistic		1.419				Anderson-Darling Gamma GOF Test					
319	5% A-D Critical Value		0.745				Data Not Gamma Distributed at 5% Significance Level					
320	K-S Test Statistic		0.205				Kolmogorov-Smirnov Gamma GOF Test					
321	5% K-S Critical Value		0.162				Data Not Gamma Distributed at 5% Significance Level					
322	Data Not Gamma Distributed at 5% Significance Level											
323	Gamma Statistics											
324	k hat (MLE)		14.04				k star (bias corrected MLE)		12.61			
325	Theta hat (MLE)		0.443				Theta star (bias corrected MLE)		0.493			
326	nu hat (MLE)		814.2				nu star (bias corrected)		731.3			
327	MLE Mean (bias corrected)		6.212				MLE Sd (bias corrected)		1.749			
328							Approximate Chi Square Value (0.05)		669.5			
329	Adjusted Level of Significance		0.0407				Adjusted Chi Square Value		666			
330	Assuming Gamma Distribution											
331	95% Approximate Gamma UCL (use when n>=50))		6.785				95% Adjusted Gamma UCL (use when n<50)		6.82			
332	Lognormal GOF Test											
333	Shapiro Wilk Test Statistic		0.873				Shapiro Wilk Lognormal GOF Test					
334	5% Shapiro Wilk Critical Value		0.926				Data Not Lognormal at 5% Significance Level					
335	Lilliefors Test Statistic		0.226				Lilliefors Lognormal GOF Test					
336	5% Lilliefors Critical Value		0.161				Data Not Lognormal at 5% Significance Level					
337	Data Not Lognormal at 5% Significance Level											
338	Lognormal Statistics											
339	Minimum of Logged Data		1.135				Mean of logged Data		1.79			
340	Maximum of Logged Data		2.361				SD of logged Data		0.285			
341	Assuming Lognormal Distribution											
342	95% H-UCL		6.872				90% Chebyshev (MVUE) UCL		7.233			
343	95% Chebyshev (MVUE) UCL		7.687				97.5% Chebyshev (MVUE) UCL		8.317			
344	99% Chebyshev (MVUE) UCL		9.555									
345	Nonparametric Distribution Free UCL Statistics											
346	Data do not follow a Discernible Distribution (0.05)											
347	Nonparametric Distribution Free UCLs											
348	95% CLT UCL		6.7				95% Jackknife UCL		6.717			
349	95% Standard Bootstrap UCL		6.686				95% Bootstrap-t UCL		6.7			
350	95% Hall's Bootstrap UCL		6.734				95% Percentile Bootstrap UCL		6.682			
351	95% BCA Bootstrap UCL		6.675									
352	90% Chebyshev(Mean, Sd) UCL		7.103				95% Chebyshev(Mean, Sd) UCL		7.506			
353	97.5% Chebyshev(Mean, Sd) UCL		8.066				99% Chebyshev(Mean, Sd) UCL		9.167			
354	Suggested UCL to Use											
355	95% Student's-t UCL		6.717				or 95% Modified-t UCL		6.717			
356												

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
357	Zinc											
358	General Statistics											
359	Total Number of Observations		29				Number of Distinct Observations		29			
360							Number of Missing Observations		9			
361			Minimum	10.9					Mean	1050		
362			Maximum	13700					Median	145		
363			SD	2559					Std. Error of Mean	475.1		
364			Coefficient of Variation	2.436					Skewness	4.614		
365	Normal GOF Test											
366	Shapiro Wilk Test Statistic		0.419				Shapiro Wilk GOF Test					
367	5% Shapiro Wilk Critical Value		0.926				Data Not Normal at 5% Significance Level					
368	Lilliefors Test Statistic		0.342				Lilliefors GOF Test					
369	5% Lilliefors Critical Value		0.161				Data Not Normal at 5% Significance Level					
370	Data Not Normal at 5% Significance Level											
371	Assuming Normal Distribution											
372	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
373	95% Student's-t UCL		1858			95% Adjusted-CLT UCL (Chen-1995)		2267				
374						95% Modified-t UCL (Johnson-1978)		1926				
375	Gamma GOF Test											
376	A-D Test Statistic		1.414			Anderson-Darling Gamma GOF Test						
377	5% A-D Critical Value		0.836			Data Not Gamma Distributed at 5% Significance Level						
378	K-S Test Statistic		0.214			Kolmogorov-Smirnov Gamma GOF Test						
379	5% K-S Critical Value		0.175			Data Not Gamma Distributed at 5% Significance Level						
380	Data Not Gamma Distributed at 5% Significance Level											
381	Gamma Statistics											
382	k hat (MLE)		0.389			k star (bias corrected MLE)		0.372				
383	Theta hat (MLE)		2699			Theta star (bias corrected MLE)		2825				
384	nu hat (MLE)		22.56			nu star (bias corrected)		21.56				
385	MLE Mean (bias corrected)		1050			MLE Sd (bias corrected)		1722				
386						Approximate Chi Square Value (0.05)		12.01				
387	Adjusted Level of Significance		0.0407			Adjusted Chi Square Value		11.59				
388	Assuming Gamma Distribution											
389	95% Approximate Gamma UCL (use when n>=50)		1885			95% Adjusted Gamma UCL (use when n<50)		1955				
390	Lognormal GOF Test											
391	Shapiro Wilk Test Statistic		0.926			Shapiro Wilk Lognormal GOF Test						
392	5% Shapiro Wilk Critical Value		0.926			Data appear Lognormal at 5% Significance Level						
393	Lilliefors Test Statistic		0.182			Lilliefors Lognormal GOF Test						
394	5% Lilliefors Critical Value		0.161			Data Not Lognormal at 5% Significance Level						
395	Data appear Approximate Lognormal at 5% Significance Level											
396	Lognormal Statistics											
397	Minimum of Logged Data		2.389			Mean of logged Data		5.258				
398	Maximum of Logged Data		9.525			SD of logged Data		1.963				
399	Assuming Lognormal Distribution											
400	95% H-UCL		5507			90% Chebyshev (MVUE) UCL		2740				
401	95% Chebyshev (MVUE) UCL		3476			97.5% Chebyshev (MVUE) UCL		4497				
402	99% Chebyshev (MVUE) UCL		6502									
403	Nonparametric Distribution Free UCL Statistics											
404	Data appear to follow a Discernible Distribution at 5% Significance Level											
405	Nonparametric Distribution Free UCLs											
406	95% CLT UCL		1832			95% Jackknife UCL		1858				
407	95% Standard Bootstrap UCL		1815			95% Bootstrap-t UCL		3314				
408	95% Hall's Bootstrap UCL		4586			95% Percentile Bootstrap UCL		1911				
409	95% BCA Bootstrap UCL		2351									
410	90% Chebyshev(Mean, Sd) UCL		2475			95% Chebyshev(Mean, Sd) UCL		3121				
411	97.5% Chebyshev(Mean, Sd) UCL		4017			99% Chebyshev(Mean, Sd) UCL		5777				
412	Suggested UCL to Use											
413	95% Chebyshev (Mean, Sd) UCL		3121									
414												

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L													
Mercury																									
General Statistics																									
417	Total Number of Observations				40	Number of Distinct Observations				40															
418						Number of Missing Observations				0															
419	Minimum				0.00226					Mean	5.399														
420	Maximum				58.1					Median	0.0976														
421	SD				11.25					Std. Error of Mean	1.778														
422	Coefficient of Variation				2.083					Skewness	3.243														
Normal GOF Test																									
424	Shapiro Wilk Test Statistic				0.559	Shapiro Wilk GOF Test																			
425	5% Shapiro Wilk Critical Value				0.94	Data Not Normal at 5% Significance Level																			
426	Lilliefors Test Statistic				0.316	Lilliefors GOF Test																			
427	5% Lilliefors Critical Value				0.139	Data Not Normal at 5% Significance Level																			
Data Not Normal at 5% Significance Level																									
Assuming Normal Distribution																									
430	95% Normal UCL				95% UCLs (Adjusted for Skewness)																				
431	95% Student's-t UCL				8.395	95% Adjusted-CLT UCL (Chen-1995)				9.298															
432						95% Modified-t UCL (Johnson-1978)				8.547															
Gamma GOF Test																									
434	A-D Test Statistic				2.076	Anderson-Darling Gamma GOF Test																			
435	5% A-D Critical Value				0.89	Data Not Gamma Distributed at 5% Significance Level																			
436	K-S Test Statistic				0.249	Kolmogorov-Smirnov Gamma GOF Test																			
437	5% K-S Critical Value				0.153	Data Not Gamma Distributed at 5% Significance Level																			
Data Not Gamma Distributed at 5% Significance Level																									
Gamma Statistics																									
440	k hat (MLE)				0.238	k star (bias corrected MLE)				0.237															
441	Theta hat (MLE)				22.66	Theta star (bias corrected MLE)				22.77															
442	nu hat (MLE)				19.06	nu star (bias corrected)				18.97															
443	MLE Mean (bias corrected)				5.399	MLE Sd (bias corrected)				11.09															
444						Approximate Chi Square Value (0.05)				10.09															
445	Adjusted Level of Significance				0.044	Adjusted Chi Square Value				9.85															
Assuming Gamma Distribution																									
447	95% Approximate Gamma UCL (use when n>=50))				10.15	95% Adjusted Gamma UCL (use when n<50)				10.4															
Lognormal GOF Test																									
449	Shapiro Wilk Test Statistic				0.898	Shapiro Wilk Lognormal GOF Test																			
450	5% Shapiro Wilk Critical Value				0.94	Data Not Lognormal at 5% Significance Level																			
451	Lilliefors Test Statistic				0.216	Lilliefors Lognormal GOF Test																			
452	5% Lilliefors Critical Value				0.139	Data Not Lognormal at 5% Significance Level																			
Data Not Lognormal at 5% Significance Level																									
Lognormal Statistics																									
455	Minimum of Logged Data				-6.092	Mean of logged Data				-1.318															
456	Maximum of Logged Data				4.062	SD of logged Data				3.084															
Assuming Lognormal Distribution																									
458	95% H-UCL				460.8	90% Chebyshev (MVUE) UCL				57.88															
459	95% Chebyshev (MVUE) UCL				75.84	97.5% Chebyshev (MVUE) UCL				100.8															
460	99% Chebyshev (MVUE) UCL				149.7																				
Nonparametric Distribution Free UCL Statistics																									
Data do not follow a Discernible Distribution (0.05)																									
Nonparametric Distribution Free UCLs																									
464	95% CLT UCL				8.324	95% Jackknife UCL				8.395															
465	95% Standard Bootstrap UCL				8.289	95% Bootstrap-t UCL				10.62															
466	95% Hall's Bootstrap UCL				14.87	95% Percentile Bootstrap UCL				8.547															
467	95% BCA Bootstrap UCL				9.599																				
468	90% Chebyshev(Mean, Sd) UCL				10.73	95% Chebyshev(Mean, Sd) UCL				13.15															
469	97.5% Chebyshev(Mean, Sd) UCL				16.5	99% Chebyshev(Mean, Sd) UCL				23.09															
Suggested UCL to Use																									
471	99% Chebyshev (Mean, Sd) UCL				23.09																				
472																									

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L										
473					UCL Statistics for Data Sets with Non-Detects																	
474		User Selected Options	North Pit 1-2 feet with Nondetects																			
475		Date/Time of Computation	ProUCL 5.112/15/2017 2:07:53 PM																			
476		From File	171215 Summary Tables Soil Statistics_b.xls																			
477		Full Precision	OFF																			
478		Confidence Coefficient	95%																			
479		Number of Bootstrap Operations	2000																			
480																						

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
Selenium												
General Statistics												
483	Total Number of Observations		29				Number of Distinct Observations		29			
484							Number of Missing Observations		9			
485	Number of Detects		27				Number of Non-Detects		2			
486	Number of Distinct Detects		27				Number of Distinct Non-Detects		2			
487	Minimum Detect		0.446				Minimum Non-Detect		0.364			
488	Maximum Detect		12.8				Maximum Non-Detect		1.3			
489	Variance Detects		7.944				Percent Non-Detects		6.897%			
490	Mean Detects		2.776				SD Detects		2.819			
491	Median Detects		1.42				CV Detects		1.015			
492	Skewness Detects		2.194				Kurtosis Detects		5.518			
493	Mean of Logged Detects		0.64				SD of Logged Detects		0.862			
Normal GOF Test on Detects Only												
495	Shapiro Wilk Test Statistic		0.743				Shapiro Wilk GOF Test					
496	5% Shapiro Wilk Critical Value		0.923				Detected Data Not Normal at 5% Significance Level					
497	Lilliefors Test Statistic		0.234				Lilliefors GOF Test					
498	5% Lilliefors Critical Value		0.167				Detected Data Not Normal at 5% Significance Level					
Detected Data Not Normal at 5% Significance Level												
500	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
501	KM Mean		2.626				KM Standard Error of Mean		0.516			
502	KM SD		2.726				95% KM (BCA) UCL		3.6			
503	95% KM (t) UCL		3.504				95% KM (Percentile Bootstrap) UCL		3.576			
504	95% KM (z) UCL		3.475				95% KM Bootstrap t UCL		4.007			
505	90% KM Chebyshev UCL		4.174				95% KM Chebyshev UCL		4.875			
506	97.5% KM Chebyshev UCL		5.848				99% KM Chebyshev UCL		7.76			
Gamma GOF Tests on Detected Observations Only												
508	A-D Test Statistic		0.914				Anderson-Darling GOF Test					
509	5% A-D Critical Value		0.764				Detected Data Not Gamma Distributed at 5% Significance Level					
510	K-S Test Statistic		0.212				Kolmogorov-Smirnov GOF					
511	5% K-S Critical Value		0.172				Detected Data Not Gamma Distributed at 5% Significance Level					
Detected Data Not Gamma Distributed at 5% Significance Level												
513	Gamma Statistics on Detected Data Only											
514	k hat (MLE)		1.456				k star (bias corrected MLE)		1.319			
515	Theta hat (MLE)		1.907				Theta star (bias corrected MLE)		2.105			
516	nu hat (MLE)		78.62				nu star (bias corrected)		71.21			
517	Mean (detects)		2.776									
Gamma ROS Statistics using Imputed Non-Detects												
519	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
520	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
521	For such situations, GROS method may yield incorrect values of UCLs and BTBs											
522	This is especially true when the sample size is small.											
523	For gamma distributed detected data, BTBs and UCLs may be computed using gamma distribution on KM estimates											
524	Minimum		0.01				Mean		2.596			
525	Maximum		12.8				Median		1.36			
526	SD		2.798				CV		1.078			
527	k hat (MLE)		1.034				k star (bias corrected MLE)		0.95			
528	Theta hat (MLE)		2.512				Theta star (bias corrected MLE)		2.734			
529	nu hat (MLE)		59.96				nu star (bias corrected)		55.09			
530	Adjusted Level of Significance (β)		0.0407									
531	Approximate Chi Square Value (55.09, α)		39.03				Adjusted Chi Square Value (55.09, β)		38.22			
532	95% Gamma Approximate UCL (use when n>=50)		3.664				95% Gamma Adjusted UCL (use when n<50)		3.742			
Estimates of Gamma Parameters using KM Estimates												
534	Mean (KM)		2.626				SD (KM)		2.726			
535	Variance (KM)		7.432				SE of Mean (KM)		0.516			
536	k hat (KM)		0.928				k star (KM)		0.855			
537	nu hat (KM)		53.83				nu star (KM)		49.59			
538	theta hat (KM)		2.83				theta star (KM)		3.071			

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
539					80% gamma percentile (KM)	4.275				90% gamma percentile (KM)		6.284
540					95% gamma percentile (KM)	8.319				99% gamma percentile (KM)		13.1
Gamma Kaplan-Meier (KM) Statistics												
542					Approximate Chi Square Value (49.59, α)	34.42			Adjusted Chi Square Value (49.59, β)			33.67
543					95% Gamma Approximate KM-UCL (use when n>=50)	3.784			95% Gamma Adjusted KM-UCL (use when n<50)			3.868
Lognormal GOF Test on Detected Observations Only												
545					Shapiro Wilk Test Statistic	0.953			Shapiro Wilk GOF Test			
546					5% Shapiro Wilk Critical Value	0.923			Detected Data appear Lognormal at 5% Significance Level			
547					Lilliefors Test Statistic	0.172			Lilliefors GOF Test			
548					5% Lilliefors Critical Value	0.167			Detected Data Not Lognormal at 5% Significance Level			
Detected Data appear Approximate Lognormal at 5% Significance Level												
Lognormal ROS Statistics Using Imputed Non-Detects												
551					Mean in Original Scale	2.621			Mean in Log Scale			0.538
552					SD in Original Scale	2.779			SD in Log Scale			0.931
553					95% t UCL (assumes normality of ROS data)	3.499			95% Percentile Bootstrap UCL			3.536
554					95% BCA Bootstrap UCL	3.754			95% Bootstrap t UCL			3.976
555					95% H-UCL (Log ROS)	4.014						
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
557					KM Mean (logged)	0.553			KM Geo Mean			1.738
558					KM SD (logged)	0.885			95% Critical H Value (KM-Log)			2.328
559					KM Standard Error of Mean (logged)	0.168			95% H-UCL (KM -Log)			3.796
560					KM SD (logged)	0.885			95% Critical H Value (KM-Log)			2.328
561					KM Standard Error of Mean (logged)	0.168						
DL/2 Statistics												
DL/2 Normal						DL/2 Log-Transformed						
564					Mean in Original Scale	2.614			Mean in Log Scale			0.522
565					SD in Original Scale	2.784			SD in Log Scale			0.955
566					95% t UCL (Assumes normality)	3.493			95% H-Stat UCL			4.113
DL/2 is not a recommended method, provided for comparisons and historical reasons												
Nonparametric Distribution Free UCL Statistics												
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level												
Suggested UCL to Use												
571					KM H-UCL	3.796						
572												

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
573						Cyanide						
574						General Statistics						
575			Total Number of Observations		29				Number of Distinct Observations	11		
576									Number of Missing Observations	9		
577			Number of Detects		1				Number of Non-Detects	28		
578			Number of Distinct Detects		1				Number of Distinct Non-Detects	10		
579			Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!									
580			It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).									
581			The data set for variable Cyanide was not processed!									
582												

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L			
Bis(2-Ethylhexyl) Phthalate															
General Statistics															
605															
607	Total Number of Observations				29					Number of Distinct Observations		22			
608										Number of Missing Observations		9			
609					Number of Detects	12				Number of Non-Detects		17			
610					Number of Distinct Detects	12				Number of Distinct Non-Detects		11			
611					Minimum Detect	0.0087				Minimum Non-Detect		0.0043			
612					Maximum Detect	0.061				Maximum Non-Detect		0.025			
613					Variance Detects	2.3675E-4				Percent Non-Detects		58.62%			
614					Mean Detects	0.0184				SD Detects		0.0154			
615					Median Detects	0.012				CV Detects		0.836			
616					Skewness Detects	2.29				Kurtosis Detects		5.469			
617					Mean of Logged Detects	-4.206				SD of Logged Detects		0.614			
618	Normal GOF Test on Detects Only														
619					Shapiro Wilk Test Statistic	0.675				Shapiro Wilk GOF Test					
620					5% Shapiro Wilk Critical Value	0.859				Detected Data Not Normal at 5% Significance Level					
621					Lilliefors Test Statistic	0.312				Lilliefors GOF Test					
622					5% Lilliefors Critical Value	0.243				Detected Data Not Normal at 5% Significance Level					
623	Detected Data Not Normal at 5% Significance Level														
624	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs														
625					KM Mean	0.0104				KM Standard Error of Mean		0.00228			
626					KM SD	0.0117				95% KM (BCA) UCL		0.0166			
627					95% KM (t) UCL	0.0143				95% KM (Percentile Bootstrap) UCL		0.0151			
628					95% KM (z) UCL	0.0142				95% KM Bootstrap t UCL		0.0172			
629					90% KM Chebyshev UCL	0.0173				95% KM Chebyshev UCL		0.0204			
630					97.5% KM Chebyshev UCL	0.0247				99% KM Chebyshev UCL		0.0331			
631	Gamma GOF Tests on Detected Observations Only														
632					A-D Test Statistic	1.106				Anderson-Darling GOF Test					
633					5% A-D Critical Value	0.74				Detected Data Not Gamma Distributed at 5% Significance Level					
634					K-S Test Statistic	0.251				Kolmogorov-Smirnov GOF					
635					5% K-S Critical Value	0.248				Detected Data Not Gamma Distributed at 5% Significance Level					
636	Detected Data Not Gamma Distributed at 5% Significance Level														
637	Gamma Statistics on Detected Data Only														
638					k hat (MLE)	2.524				k star (bias corrected MLE)		1.949			
639					Theta hat (MLE)	0.00729				Theta star (bias corrected MLE)		0.00944			
640					nu hat (MLE)	60.58				nu star (bias corrected)		46.77			
641					Mean (detects)	0.0184									
642	Gamma ROS Statistics using Imputed Non-Detects														
643	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs														
644	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)														
645	For such situations, GROS method may yield incorrect values of UCLs and BTBs														
646	This is especially true when the sample size is small.														
647	For gamma distributed detected data, BTBs and UCLs may be computed using gamma distribution on KM estimates														
648					Minimum	0.0087				Mean		0.0135			
649					Maximum	0.061				Median		0.01			
650					SD	0.0105				CV		0.781			
651					k hat (MLE)	3.91				k star (bias corrected MLE)		3.528			
652					Theta hat (MLE)	0.00345				Theta star (bias corrected MLE)		0.00382			
653					nu hat (MLE)	226.8				nu star (bias corrected)		204.7			
654					Adjusted Level of Significance (β)	0.0407									
655					Approximate Chi Square Value (204.65, α)	172.5				Adjusted Chi Square Value (204.65, β)		170.8			
656					95% Gamma Approximate UCL (use when n>=50)	0.016				95% Gamma Adjusted UCL (use when n<50)		0.0161			
657	Estimates of Gamma Parameters using KM Estimates														
658					Mean (KM)	0.0104				SD (KM)		0.0117			
659					Variance (KM)	1.3653E-4				SE of Mean (KM)		0.00228			
660					k hat (KM)	0.797				k star (KM)		0.737			
661					nu hat (KM)	46.22				nu star (KM)		42.77			
662					theta hat (KM)	0.0131				theta star (KM)		0.0141			

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	A	B	C	D	E	F	G	H	I	J	K	L
663					80% gamma percentile (KM)	0.0171				90% gamma percentile (KM)		0.0259
664					95% gamma percentile (KM)	0.0348				99% gamma percentile (KM)		0.0562
665 Gamma Kaplan-Meier (KM) Statistics												
666					Approximate Chi Square Value (42.77, α)	28.77			Adjusted Chi Square Value (42.77, β)		28.09	
667					95% Gamma Approximate KM-UCL (use when n>=50)	0.0155			95% Gamma Adjusted KM-UCL (use when n<50)		0.0159	
668 Lognormal GOF Test on Detected Observations Only												
669					Shapiro Wilk Test Statistic	0.826			Shapiro Wilk GOF Test			
670					5% Shapiro Wilk Critical Value	0.859			Detected Data Not Lognormal at 5% Significance Level			
671					Lilliefors Test Statistic	0.207			Lilliefors GOF Test			
672					5% Lilliefors Critical Value	0.243			Detected Data appear Lognormal at 5% Significance Level			
673 Detected Data appear Approximate Lognormal at 5% Significance Level												
674 Lognormal ROS Statistics Using Imputed Non-Detects												
675					Mean in Original Scale	0.00968			Mean in Log Scale		-5.082	
676					SD in Original Scale	0.0122			SD in Log Scale		0.88	
677					95% t UCL (assumes normality of ROS data)	0.0135			95% Percentile Bootstrap UCL		0.0136	
678					95% BCA Bootstrap UCL	0.0154			95% Bootstrap t UCL		0.0172	
679					95% H-UCL (Log ROS)	0.0135						
680 Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
681					KM Mean (logged)	-4.893			KM Geo Mean		0.0075	
682					KM SD (logged)	0.715			95% Critical H Value (KM-Log)		2.144	
683					KM Standard Error of Mean (logged)	0.142			95% H-UCL (KM -Log)		0.0129	
684					KM SD (logged)	0.715			95% Critical H Value (KM-Log)		2.144	
685					KM Standard Error of Mean (logged)	0.142						
686 DL/2 Statistics												
687 DL/2 Normal									DL/2 Log-Transformed			
688					Mean in Original Scale	0.0105			Mean in Log Scale		-4.912	
689					SD in Original Scale	0.0119			SD in Log Scale		0.773	
690					95% t UCL (Assumes normality)	0.0142			95% H-Stat UCL		0.0137	
691 DL/2 is not a recommended method, provided for comparisons and historical reasons												
692 Nonparametric Distribution Free UCL Statistics												
693 Detected Data appear Approximate Lognormal Distributed at 5% Significance Level												
694 Suggested UCL to Use												
695					KM H-UCL	0.0129						
696												

North Pit Soils 1 - 2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L						
697	High Molecular Weight PAHs																	
698	General Statistics																	
699	Total Number of Observations	29					Number of Distinct Observations	28										
700							Number of Missing Observations	9										
701	Number of Detects	27					Number of Non-Detects	2										
702	Number of Distinct Detects	26					Number of Distinct Non-Detects	2										
703	Minimum Detect	0.0216					Minimum Non-Detect	0.0167										
704	Maximum Detect	2.95					Maximum Non-Detect	0.0178										
705	Variance Detects	0.388					Percent Non-Detects	6.897%										
706	Mean Detects	0.432					SD Detects	0.623										
707	Median Detects	0.211					CV Detects	1.442										
708	Skewness Detects	2.939					Kurtosis Detects	10.25										
709	Mean of Logged Detects	-1.652					SD of Logged Detects	1.368										
710	Normal GOF Test on Detects Only																	
711	Shapiro Wilk Test Statistic	0.653					Shapiro Wilk GOF Test											
712	5% Shapiro Wilk Critical Value	0.923					Detected Data Not Normal at 5% Significance Level											
713	Lilliefors Test Statistic	0.255					Lilliefors GOF Test											
714	5% Lilliefors Critical Value	0.167					Detected Data Not Normal at 5% Significance Level											
715	Detected Data Not Normal at 5% Significance Level																	
716	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																	
717	KM Mean	0.403					KM Standard Error of Mean	0.113										
718	KM SD	0.599					95% KM (BCA) UCL	0.597										
719	95% KM (t) UCL	0.596					95% KM (Percentile Bootstrap) UCL	0.608										
720	95% KM (z) UCL	0.59					95% KM Bootstrap t UCL	0.786										
721	90% KM Chebyshev UCL	0.744					95% KM Chebyshev UCL	0.898										
722	97.5% KM Chebyshev UCL	1.111					99% KM Chebyshev UCL	1.532										
723	Gamma GOF Tests on Detected Observations Only																	
724	A-D Test Statistic	0.447					Anderson-Darling GOF Test											
725	5% A-D Critical Value	0.785					Detected data appear Gamma Distributed at 5% Significance Level											
726	K-S Test Statistic	0.116					Kolmogorov-Smirnov GOF											
727	5% K-S Critical Value	0.175					Detected data appear Gamma Distributed at 5% Significance Level											
728	Detected data appear Gamma Distributed at 5% Significance Level																	
729	Gamma Statistics on Detected Data Only																	
730	k hat (MLE)	0.738					k star (bias corrected MLE)	0.681										
731	Theta hat (MLE)	0.585					Theta star (bias corrected MLE)	0.634										
732	nu hat (MLE)	39.87					nu star (bias corrected)	36.78										
733	Mean (detects)	0.432																
734	Gamma ROS Statistics using Imputed Non-Detects																	
735	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																	
736	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																	
737	For such situations, GROS method may yield incorrect values of UCLs and BTVs																	
738	This is especially true when the sample size is small.																	
739	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																	
740	Minimum	0.01					Mean	0.403										
741	Maximum	2.95					Median	0.155										
742	SD	0.61					CV	1.514										
743	k hat (MLE)	0.646					k star (bias corrected MLE)	0.602										
744	Theta hat (MLE)	0.624					Theta star (bias corrected MLE)	0.669										
745	nu hat (MLE)	37.46					nu star (bias corrected)	34.92										
746	Adjusted Level of Significance (β)	0.0407																
747	Approximate Chi Square Value (34.92, α)	22.4					Adjusted Chi Square Value (34.92, β)	21.8										
748	95% Gamma Approximate UCL (use when n>=50)	0.628					95% Gamma Adjusted UCL (use when n<50)	0.645										
749	Estimates of Gamma Parameters using KM Estimates																	
750	Mean (KM)	0.403					SD (KM)	0.599										
751	Variance (KM)	0.359					SE of Mean (KM)	0.113										
752	k hat (KM)	0.453					k star (KM)	0.43										
753	nu hat (KM)	26.3					nu star (KM)	24.92										
754	theta hat (KM)	0.89					theta star (KM)	0.939										

North Pit Soils 1 - 2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
755					80% gamma percentile (KM)	0.656				90% gamma percentile (KM)		1.125
756					95% gamma percentile (KM)	1.635				99% gamma percentile (KM)		2.909
Gamma Kaplan-Meier (KM) Statistics												
758					Approximate Chi Square Value (24.92, α)	14.55			Adjusted Chi Square Value (24.92, β)			14.07
759					95% Gamma Approximate KM-UCL (use when n>=50)	0.691			95% Gamma Adjusted KM-UCL (use when n<50)			0.714
Lognormal GOF Test on Detected Observations Only												
761					Shapiro Wilk Test Statistic	0.964			Shapiro Wilk GOF Test			
762					5% Shapiro Wilk Critical Value	0.923			Detected Data appear Lognormal at 5% Significance Level			
763					Lilliefors Test Statistic	0.0807			Lilliefors GOF Test			
764					5% Lilliefors Critical Value	0.167			Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level												
Lognormal ROS Statistics Using Imputed Non-Detects												
767					Mean in Original Scale	0.403			Mean in Log Scale			-1.874
768					SD in Original Scale	0.61			SD in Log Scale			1.559
769					95% t UCL (assumes normality of ROS data)	0.596			95% Percentile Bootstrap UCL			0.601
770					95% BCA Bootstrap UCL	0.668			95% Bootstrap t UCL			0.761
771					95% H-UCL (Log ROS)	1.343						
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
773					KM Mean (logged)	-1.82			KM Geo Mean			0.162
774					KM SD (logged)	1.435			95% Critical H Value (KM-Log)			3.053
775					KM Standard Error of Mean (logged)	0.272			95% H-UCL (KM -Log)			1.039
776					KM SD (logged)	1.435			95% Critical H Value (KM-Log)			3.053
777					KM Standard Error of Mean (logged)	0.272						
DL/2 Statistics												
DL/2 Normal						DL/2 Log-Transformed						
780					Mean in Original Scale	0.403			Mean in Log Scale			-1.865
781					SD in Original Scale	0.61			SD in Log Scale			1.542
782					95% t UCL (Assumes normality)	0.596			95% H-Stat UCL			1.295
DL/2 is not a recommended method, provided for comparisons and historical reasons												
Nonparametric Distribution Free UCL Statistics												
Detected Data appear Gamma Distributed at 5% Significance Level												
Suggested UCL to Use												
787						0.714		Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<				

**0 - 2 feet bgs Soil Analytical Data Summary South Area
Brine Service Company Superfund Site**

Location	Depth	Barium	Cadmium	D_Cadmium	Chromium	Copper	Lead	Nickel	Selenium	D_Selenium	Zinc	Mercury	44-DDD	D_44-DDD	44-DDE	D_44-DDE	44-DDT	D_44-DDT	Dieldrin	D_Dieldrin	Endrin	D_Endrin	HMWPAH	D_HMWPAH
ESSB10	0-0.5 ft	2.03E+02	1.92E-01	1	5.01E+00	6.01E+00	1.04E+01	5.51E+00	1.09E+00	1	2.39E+01	1.15E-02	5.80E-04	0	5.80E-04	0	5.80E-04	0	5.80E-04	0	7.00E-04	0	8.08E-02	1
ESSB11	0-0.5 ft	2.06E+02	1.17E-01	1	3.47E+00	4.19E+00	7.93E+00	3.31E+00	5.30E-01	0	1.88E+01	1.10E-02	5.40E-04	0	5.40E-04	0	5.40E-04	0	5.40E-04	0	6.40E-04	0	9.36E-02	1
ESSS01	0-0.5 ft	1.56E+02	1.26E-01	1	3.03E+00	2.91E+00	5.14E+00	3.15E+00	2.50E-01	0	1.28E+01	6.02E-03	5.60E-04	0	5.60E-04	0	5.60E-04	0	5.60E-04	0	6.70E-04	0	1.68E-02	1
ESSS02	0-0.5 ft	4.67E+02	2.14E-01	1	4.23E+00	5.53E+00	1.05E+01	4.76E+00	3.00E-01	0	2.59E+01	1.33E-02	6.40E-04	0	6.40E-04	0	2.90E-03	1	6.40E-04	0	7.60E-04	0	7.08E-02	1
ESSS03	0-0.5 ft	1.18E+03	1.78E+00	1	1.78E+02	7.03E+01	1.43E+02	9.27E+00	5.71E-01	1	3.83E+02	1.98E+00	1.10E-01	1	3.30E-02	1	3.20E-02	1	5.70E-02	1	2.20E-02	1	1.05E+00	1
ESSS04	0-0.5 ft	3.01E+02	4.00E-01	1	8.38E+00	8.72E+00	2.97E+01	9.00E+00	5.03E-01	1	4.25E+01	4.39E-02	2.90E-03	0	2.90E-03	0	2.90E-03	0	2.90E-03	0	3.50E-03	0	1.79E-01	1
ESSS05	0-0.5 ft	1.07E+03	5.69E+00	1	3.48E+01	3.99E+01	1.14E+02	7.69E+00	1.70E+00	1	8.11E+02	5.57E+00	6.10E-02	1	5.80E-03	0	3.40E-02	1	5.80E-03	0	7.00E-03	0	1.52E-01	1
ESSS05	0-0.5 ft	1.00E+03	5.73E+00	1	3.14E+01	3.74E+01	1.00E+02	7.34E+00	1.42E+00	1	8.32E+02	2.32E+00	3.00E-02	1	5.80E-03	0	2.50E-02	1	5.80E-03	0	7.00E-03	0	5.92E-01	1
ESSS12	0-0.5 ft	2.24E+02	1.47E-01	1	5.86E+00	6.04E+00	9.33E+00	5.31E+00	1.19E+00	1	1.83E+01	1.24E-02	5.80E-04	0	5.80E-04	0	5.80E-04	0	5.80E-04	0	6.90E-04	0	6.10E-02	1
SPSS01	0-0.5 ft	2.79E+02	4.10E-01	0	7.45E+00	8.56E+00	1.91E+01	4.92E+00	2.60E+00	0	8.81E+01	4.53E-02	5.50E-03	0	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	9.72E-01	1
SPSS02	0-0.5 ft	2.90E+02	3.90E-01	0	6.06E+00	1.02E+01	1.39E+01	6.34E+00	2.40E+00	0	4.47E+01	3.44E-02	5.40E-03	0	5.40E-03	0	5.40E-03	0	5.40E-03	0	6.50E-03	0	2.53E-01	1
SPSS03	0-0.5 ft	2.80E+02	7.57E-01	1	1.76E+01	1.06E+01	6.51E+01	7.09E+00	2.50E+00	0	4.23E+02	2.57E-01	5.50E-03	0	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	6.72E-01	1
SPSS03	0-0.5 ft	3.05E+02	7.39E-01	1	2.05E+01	1.09E+01	6.11E+01	7.90E+00	2.40E+00	0	4.26E+02	3.98E-01	5.50E-03	0	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	6.13E-01	1
SPSS04	0-0.5 ft	2.98E+02	6.68E-01	1	8.81E+01	1.59E+01	2.53E+02	4.18E+00	2.40E+00	0	7.72E+02	9.00E-02	2.60E-03	0	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	2.86E-01	1
SPSS05	0-0.5 ft	1.19E+02	4.19E-01	1	6.53E+01	6.56E+00	2.77E+02	2.71E+00	2.50E+00	0	2.70E+03	1.06E-01	2.60E-03	0	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	3.52E-01	1
SPSS06	0-0.5 ft	5.44E+02	6.99E+00	1	2.28E+01	1.05E+02	1.37E+02	1.22E+01	2.70E+00	0	1.95E+03	1.73E+00	2.80E-03	0	2.80E-03	0	2.80E-03	0	2.80E-03	0	3.40E-03	0	2.61E-01	1
SPSS07	0-0.5 ft	2.80E+02	1.28E+00	1	2.63E+01	1.49E+01	6.14E+01	1.36E+01	2.30E+00	0	7.96E+02	4.88E-01	2.60E-03	0	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	3.22E-01	1
SPSS08	0-0.5 ft	2.63E+02	4.40E-01	0	7.07E+00	5.55E+00	1.10E+01	4.79E+00	2.80E+00	0	5.18E+01	4.22E-02	5.70E-04	0	2.10E-03	1	3.40E-03	1	5.70E-04	0	6.90E-04	0	1.32E-01	1
WSS01	0-0.5 ft	1.00E+03	3.43E-01	1	1.02E+01	1.31E+01	5.84E+01	7.20E+00	4.66E-01	1	9.12E+01	2.72E-02	5.70E-03	0	5.70E-03	0	5.70E-03	0	5.70E-03	0	6.80E-03	0	6.15E-01	1
WSS02	0-0.5 ft	5.51E+02	3.97E-01	1	1.28E+01	1.09E+01	3.99E+01	7.56E+00	3.94E-01	1	1.85E+02	4.29E-02	5.90E-03	0	5.90E-03	0	5.90E-03	0	5.90E-03	0	7.10E-03	0	6.74E-01	1
WSS03	0-0.5 ft	1.33E+02	5.89E-01	1	1.16E+01	1.43E+01	2.02E+02	7.13E+00	2.70E-01	0	1.63E+03	4.09E-02	5.60E-03	0	5.60E-03	0	5.60E-03	0	5.60E-03	0	6.80E-03	0	6.35E-01	1
WSS04	0-0.5 ft	3.35E+02	9.82E-01	1	2.10E+01	1.13E+01	5.23E+01	1.01E+01	3.95E-01	1	6.44E+02	2.63E-01	2.70E-03	0	2.70E-03	0	2.70E-03	0	2.70E-03	0	3.30E-03	0	1.35E-01	1
WSS09	0-0.5 ft																							
WSB02	0-1 ft	4.42E+02	3.62E-01	1	7.91E+00	8.08E+00	3.12E+01	6.43E+00	7.98E-01	1	7.65E+01	2.33E-02	3.40E-03	0	3.40E-03	0	3.40E-03	0	3.40E-03	0	4.10E-03	0	2.79E-01	1
ESSB01	1-2 ft	1.12E+02	1.77E-01	1	6.90E+00	7.03E+00	1.10E+01	7.23E+00	7.65E-01	1	2.33E+01	1.49E-02	5.90E-04	0	5.90E-04	0	5.90E-04	0	5.90E-04	0	7.10E-04	0	1.72E-02	0
ESSB02	1-2 ft	2.16E+02	2.30E-01	1	8.23E+00	8.39E+00	2.57E+01	9.32E+00	8.20E-01	1	2.66E+01	1.59E-02	3.00E-03	0	3.00E-03	0	3.00E-03	0	3.00E-03	0	3.60E-03	0	1.90E-02	1
ESSB03	1-2 ft	1.24E+03	1.31E+01	1	2.16E+02	1.23E+02	2.32E+02	1.29E+01	1.90E+00	1	1.96E+03	2.95E+00	7.50E-02	1	5.90E-03	0	5.60E-02	1	5.90E-03	0	7.10E-03	0	3.52E+00	1
ESSB03	1-2 ft																							

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2	User Selected Options	South Pit 0-2 feet bgs										
3	Date/Time of Computation	ProUCL 5.112/15/2017 5:38:43 PM										
4	From File	171215 Summary Tables Soil Statistics_c.xls										
5	Full Precision	OFF										
6	Confidence Coefficient	95%										
7	Number of Bootstrap Operations	2000										
8												

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L						
9	Barium																	
10	General Statistics																	
11	Total Number of Observations				55	Number of Distinct Observations				52								
12						Number of Missing Observations				2								
13	Minimum				90.9	Mean				572.6								
14	Maximum				2220	Median				298								
15	SD				537.3	Std. Error of Mean				72.45								
16	Coefficient of Variation				0.938	Skewness				1.594								
17	Normal GOF Test																	
18	Shapiro Wilk Test Statistic				0.77	Shapiro Wilk GOF Test												
19	5% Shapiro Wilk P Value				4.863E-11	Data Not Normal at 5% Significance Level												
20	Lilliefors Test Statistic				0.236	Lilliefors GOF Test												
21	5% Lilliefors Critical Value				0.119	Data Not Normal at 5% Significance Level												
22	Data Not Normal at 5% Significance Level																	
23	Assuming Normal Distribution																	
24	95% Normal UCL					95% UCLs (Adjusted for Skewness)												
25	95% Student's-t UCL				693.9	95% Adjusted-CLT UCL (Chen-1995)				708.4								
26						95% Modified-t UCL (Johnson-1978)				696.5								
27	Gamma GOF Test																	
28	A-D Test Statistic				2.119	Anderson-Darling Gamma GOF Test												
29	5% A-D Critical Value				0.768	Data Not Gamma Distributed at 5% Significance Level												
30	K-S Test Statistic				0.205	Kolmogorov-Smirnov Gamma GOF Test												
31	5% K-S Critical Value				0.122	Data Not Gamma Distributed at 5% Significance Level												
32	Data Not Gamma Distributed at 5% Significance Level																	
33	Gamma Statistics																	
34	k hat (MLE)				1.5	k star (bias corrected MLE)				1.43								
35	Theta hat (MLE)				381.8	Theta star (bias corrected MLE)				400.4								
36	nu hat (MLE)				165	nu star (bias corrected)				157.3								
37	MLE Mean (bias corrected)				572.6	MLE Sd (bias corrected)				478.8								
38						Approximate Chi Square Value (0.05)				129.3								
39	Adjusted Level of Significance				0.0456	Adjusted Chi Square Value				128.6								
40	Assuming Gamma Distribution																	
41	95% Approximate Gamma UCL (use when n>=50)				696.6	95% Adjusted Gamma UCL (use when n<50)				700.3								
42	Lognormal GOF Test																	
43	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk Lognormal GOF Test												
44	5% Shapiro Wilk P Value				0.00392	Data Not Lognormal at 5% Significance Level												
45	Lilliefors Test Statistic				0.166	Lilliefors Lognormal GOF Test												
46	5% Lilliefors Critical Value				0.119	Data Not Lognormal at 5% Significance Level												
47	Data Not Lognormal at 5% Significance Level																	
48	Lognormal Statistics																	
49	Minimum of Logged Data				4.51	Mean of logged Data				5.981								
50	Maximum of Logged Data				7.705	SD of logged Data				0.847								
51	Assuming Lognormal Distribution																	
52																		
53	95% H-UCL				727.6	90% Chebyshev (MVUE) UCL				780.6								
54	95% Chebyshev (MVUE) UCL				879.7	97.5% Chebyshev (MVUE) UCL				1017								
55	99% Chebyshev (MVUE) UCL				1287													
56	Nonparametric Distribution Free UCL Statistics																	
57	Data do not follow a Discernible Distribution (0.05)																	
58	Nonparametric Distribution Free UCLs																	
59	95% CLT UCL				691.8	95% Jackknife UCL				693.9								
60	95% Standard Bootstrap UCL				689.5	95% Bootstrap-t UCL				719.2								
61	95% Hall's Bootstrap UCL				703	95% Percentile Bootstrap UCL				692.4								
62	95% BCA Bootstrap UCL				707.2													
63	90% Chebyshev(Mean, Sd) UCL				790	95% Chebyshev(Mean, Sd) UCL				888.4								
64	97.5% Chebyshev(Mean, Sd) UCL				1025	99% Chebyshev(Mean, Sd) UCL				1293								
65	Suggested UCL to Use																	
66	95% Chebyshev (Mean, Sd) UCL				888.4													
67																		

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L							
68	Chromium																		
69	General Statistics																		
70	Total Number of Observations			55	Number of Distinct Observations			53											
71					Number of Missing Observations			2											
72	Minimum			3.03	Mean			30.74											
73	Maximum			234	Median			8.76											
74	SD			50.73	Std. Error of Mean			6.84											
75	Coefficient of Variation			1.65	Skewness			2.784											
76	Normal GOF Test																		
77	Shapiro Wilk Test Statistic			0.564	Shapiro Wilk GOF Test														
78	5% Shapiro Wilk P Value			0	Data Not Normal at 5% Significance Level														
79	Lilliefors Test Statistic			0.326	Lilliefors GOF Test														
80	5% Lilliefors Critical Value			0.119	Data Not Normal at 5% Significance Level														
81	Data Not Normal at 5% Significance Level																		
82	Assuming Normal Distribution																		
83	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
84	95% Student's-t UCL			42.19	95% Adjusted-CLT UCL (Chen-1995)			44.74											
85					95% Modified-t UCL (Johnson-1978)			42.62											
86	Gamma GOF Test																		
87	A-D Test Statistic			4.862	Anderson-Darling Gamma GOF Test														
88	5% A-D Critical Value			0.792	Data Not Gamma Distributed at 5% Significance Level														
89	K-S Test Statistic			0.231	Kolmogorov-Smirnov Gamma GOF Test														
90	5% K-S Critical Value			0.125	Data Not Gamma Distributed at 5% Significance Level														
91	Data Not Gamma Distributed at 5% Significance Level																		
92	Gamma Statistics																		
93	k hat (MLE)			0.77	k star (bias corrected MLE)			0.74											
94	Theta hat (MLE)			39.92	Theta star (bias corrected MLE)			41.54											
95	nu hat (MLE)			84.71	nu star (bias corrected)			81.42											
96	MLE Mean (bias corrected)			30.74	MLE Sd (bias corrected)			35.73											
97					Approximate Chi Square Value (0.05)			61.63											
98	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			61.17											
99	Assuming Gamma Distribution																		
100	95% Approximate Gamma UCL (use when n>=50))			40.62	95% Adjusted Gamma UCL (use when n<50)			40.93											
101	Lognormal GOF Test																		
102	Shapiro Wilk Test Statistic			0.873	Shapiro Wilk Lognormal GOF Test														
103	5% Shapiro Wilk P Value			3.9942E-6	Data Not Lognormal at 5% Significance Level														
104	Lilliefors Test Statistic			0.181	Lilliefors Lognormal GOF Test														
105	5% Lilliefors Critical Value			0.119	Data Not Lognormal at 5% Significance Level														
106	Data Not Lognormal at 5% Significance Level																		
107	Lognormal Statistics																		
108	Minimum of Logged Data			1.109	Mean of logged Data			2.651											
109	Maximum of Logged Data			5.455	SD of logged Data			1.115											
110	Assuming Lognormal Distribution																		
111	95% H-UCL			38.42	90% Chebyshev (MVUE) UCL			40.1											
112	95% Chebyshev (MVUE) UCL			46.53	97.5% Chebyshev (MVUE) UCL			55.46											
113	99% Chebyshev (MVUE) UCL			72.99															
114	Nonparametric Distribution Free UCL Statistics																		
115	Data do not follow a Discernible Distribution (0.05)																		
116	Nonparametric Distribution Free UCLs																		
117	95% CLT UCL			42	95% Jackknife UCL			42.19											
118	95% Standard Bootstrap UCL			41.79	95% Bootstrap-t UCL			47.43											
119	95% Hall's Bootstrap UCL			45.71	95% Percentile Bootstrap UCL			42.7											
120	95% BCA Bootstrap UCL			45.97															
121	90% Chebyshev(Mean, Sd) UCL			51.26	95% Chebyshev(Mean, Sd) UCL			60.56											
122	97.5% Chebyshev(Mean, Sd) UCL			73.46	99% Chebyshev(Mean, Sd) UCL			98.8											
123	Suggested UCL to Use																		
124	95% Chebyshev (Mean, Sd) UCL			60.56															
125																			
126																			

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L							
127	Copper																		
128	General Statistics																		
129	Total Number of Observations			55	Number of Distinct Observations			54											
130					Number of Missing Observations			2											
131	Minimum			2.91					Mean										
132	Maximum			234					Median										
133	SD			45.26					Std. Error of Mean										
134	Coefficient of Variation			1.572					Skewness										
135	Normal GOF Test																		
136	Shapiro Wilk Test Statistic			0.577	Shapiro Wilk GOF Test														
137	5% Shapiro Wilk P Value			0					Data Not Normal at 5% Significance Level										
138	Lilliefors Test Statistic			0.348	Lilliefors GOF Test														
139	5% Lilliefors Critical Value			0.119					Data Not Normal at 5% Significance Level										
140	Data Not Normal at 5% Significance Level																		
141	Assuming Normal Distribution																		
142	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
143	95% Student's-t UCL			39					95% Adjusted-CLT UCL (Chen-1995)										
144									95% Modified-t UCL (Johnson-1978)										
145	Gamma GOF Test																		
146	A-D Test Statistic			5.043	Anderson-Darling Gamma GOF Test														
147	5% A-D Critical Value			0.787					Data Not Gamma Distributed at 5% Significance Level										
148	K-S Test Statistic			0.273	Kolmogorov-Smirnov Gamma GOF Test														
149	5% K-S Critical Value			0.124					Data Not Gamma Distributed at 5% Significance Level										
150	Data Not Gamma Distributed at 5% Significance Level																		
151	Gamma Statistics																		
152	k hat (MLE)			0.858					k star (bias corrected MLE)										
153	Theta hat (MLE)			33.55					Theta star (bias corrected MLE)										
154	nu hat (MLE)			94.38					nu star (bias corrected)										
155	MLE Mean (bias corrected)			28.79					MLE Sd (bias corrected)										
156									Approximate Chi Square Value (0.05)										
157	Adjusted Level of Significance			0.0456					Adjusted Chi Square Value										
158	Assuming Gamma Distribution																		
159	95% Approximate Gamma UCL (use when n>=50))			37.45					95% Adjusted Gamma UCL (use when n<50)										
160	Lognormal GOF Test																		
161	Shapiro Wilk Test Statistic			0.871	Shapiro Wilk Lognormal GOF Test														
162	5% Shapiro Wilk P Value			3.3769E-6					Data Not Lognormal at 5% Significance Level										
163	Lilliefors Test Statistic			0.187	Lilliefors Lognormal GOF Test														
164	5% Lilliefors Critical Value			0.119					Data Not Lognormal at 5% Significance Level										
165	Data Not Lognormal at 5% Significance Level																		
166	Lognormal Statistics																		
167	Minimum of Logged Data			1.068					Mean of logged Data										
168	Maximum of Logged Data			5.455					SD of logged Data										
169	Assuming Lognormal Distribution																		
170	95% H-UCL			35.05					90% Chebyshev (MVUE) UCL										
171	95% Chebyshev (MVUE) UCL			42.64					97.5% Chebyshev (MVUE) UCL										
172	99% Chebyshev (MVUE) UCL			65.75															
173	Nonparametric Distribution Free UCL Statistics																		
174	Data do not follow a Discernible Distribution (0.05)																		
175	Nonparametric Distribution Free UCLs																		
176	95% CLT UCL			38.83					95% Jackknife UCL										
177	95% Standard Bootstrap UCL			38.56					95% Bootstrap-t UCL										
178	95% Hall's Bootstrap UCL			43.27					95% Percentile Bootstrap UCL										
179	95% BCA Bootstrap UCL			41.53															
180	90% Chebyshev(Mean, Sd) UCL			47.1					95% Chebyshev(Mean, Sd) UCL										
181	97.5% Chebyshev(Mean, Sd) UCL			66.9					99% Chebyshev(Mean, Sd) UCL										
182	Suggested UCL to Use																		
183	95% Chebyshev (Mean, Sd) UCL			55.39															
184																			
185																			

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L							
186	Lead																		
187	General Statistics																		
188	Total Number of Observations			55	Number of Distinct Observations			53											
189					Number of Missing Observations			2											
190	Minimum			5.14	Mean			73.15											
191	Maximum			359	Median			34.1											
192	SD			80.91	Std. Error of Mean			10.91											
193	Coefficient of Variation			1.106	Skewness			1.68											
194	Normal GOF Test																		
195	Shapiro Wilk Test Statistic			0.783	Shapiro Wilk GOF Test														
196	5% Shapiro Wilk P Value			1.846E-10	Data Not Normal at 5% Significance Level														
197	Lilliefors Test Statistic			0.2	Lilliefors GOF Test														
198	5% Lilliefors Critical Value			0.119	Data Not Normal at 5% Significance Level														
199	Data Not Normal at 5% Significance Level																		
200	Assuming Normal Distribution																		
201	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
202	95% Student's-t UCL			91.4	95% Adjusted-CLT UCL (Chen-1995)			93.73											
203					95% Modified-t UCL (Johnson-1978)			91.82											
204	Gamma GOF Test																		
205	A-D Test Statistic			1.072	Anderson-Darling Gamma GOF Test														
206	5% A-D Critical Value			0.781	Data Not Gamma Distributed at 5% Significance Level														
207	K-S Test Statistic			0.13	Kolmogorov-Smirnov Gamma GOF Test														
208	5% K-S Critical Value			0.124	Data Not Gamma Distributed at 5% Significance Level														
209	Data Not Gamma Distributed at 5% Significance Level																		
210	Gamma Statistics																		
211	k hat (MLE)			0.965	k star (bias corrected MLE)			0.924											
212	Theta hat (MLE)			75.82	Theta star (bias corrected MLE)			79.15											
213	nu hat (MLE)			106.1	nu star (bias corrected)			101.7											
214	MLE Mean (bias corrected)			73.15	MLE Sd (bias corrected)			76.09											
215					Approximate Chi Square Value (0.05)			79.4											
216	Adjusted Level of Significance			0.0456	Adjusted Chi Square Value			78.87											
217	Assuming Gamma Distribution																		
218	95% Approximate Gamma UCL (use when n>=50))			93.66	95% Adjusted Gamma UCL (use when n<50)			94.28											
219	Lognormal GOF Test																		
220	Shapiro Wilk Test Statistic			0.948	Shapiro Wilk Lognormal GOF Test														
221	5% Shapiro Wilk P Value			0.0332	Data Not Lognormal at 5% Significance Level														
222	Lilliefors Test Statistic			0.0892	Lilliefors Lognormal GOF Test														
223	5% Lilliefors Critical Value			0.119	Data appear Lognormal at 5% Significance Level														
224	Data appear Approximate Lognormal at 5% Significance Level																		
225	Lognormal Statistics																		
226	Minimum of Logged Data			1.637	Mean of logged Data			3.692											
227	Maximum of Logged Data			5.883	SD of logged Data			1.151											
228	Assuming Lognormal Distribution																		
229	95% H-UCL			115.7	90% Chebyshev (MVUE) UCL			119.8											
230	95% Chebyshev (MVUE) UCL			139.6	97.5% Chebyshev (MVUE) UCL			167											
231	99% Chebyshev (MVUE) UCL			220.8															
232	Nonparametric Distribution Free UCL Statistics																		
233	Data appear to follow a Discernible Distribution at 5% Significance Level																		
234	Nonparametric Distribution Free UCLs																		
235	95% CLT UCL			91.09	95% Jackknife UCL			91.4											
236	95% Standard Bootstrap UCL			91.12	95% Bootstrap-t UCL			95.25											
237	95% Hall's Bootstrap UCL			93.57	95% Percentile Bootstrap UCL			92.49											
238	95% BCA Bootstrap UCL			94.3															
239	90% Chebyshev(Mean, Sd) UCL			105.9	95% Chebyshev(Mean, Sd) UCL			120.7											
240	97.5% Chebyshev(Mean, Sd) UCL			141.3	99% Chebyshev(Mean, Sd) UCL			181.7											
241	Suggested UCL to Use																		
242	95% H-UCL			115.7															
243	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.																		
244	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.																		
245	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.																		
246	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.																		
247																			

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

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**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
306							Zinc					
307							General Statistics					
308				Total Number of Observations	55			Number of Distinct Observations	55			
309								Number of Missing Observations	2			
310				Minimum	12.8					Mean	416.2	
311				Maximum	2700					Median	76.5	
312				SD	658.5			Std. Error of Mean	88.8			
313				Coefficient of Variation	1.582			Skewness	1.931			
314						Normal GOF Test						
315				Shapiro Wilk Test Statistic	0.653		Shapiro Wilk GOF Test					
316				5% Shapiro Wilk P Value	5.551E-16			Data Not Normal at 5% Significance Level				
317				Lilliefors Test Statistic	0.325		Lilliefors GOF Test					
318				5% Lilliefors Critical Value	0.119			Data Not Normal at 5% Significance Level				
319						Data Not Normal at 5% Significance Level						
320						Assuming Normal Distribution						
321					95% Normal UCL			95% UCLs (Adjusted for Skewness)				
322					95% Student's-t UCL	564.8		95% Adjusted-CLT UCL (Chen-1995)	587			
323								95% Modified-t UCL (Johnson-1978)	568.7			
324						Gamma GOF Test						
325					A-D Test Statistic	3.299		Anderson-Darling Gamma GOF Test				
326					5% A-D Critical Value	0.813		Data Not Gamma Distributed at 5% Significance Level				
327					K-S Test Statistic	0.229		Kolmogorov-Smirnov Gamma GOF Test				
328					5% K-S Critical Value	0.127		Data Not Gamma Distributed at 5% Significance Level				
329						Data Not Gamma Distributed at 5% Significance Level						
330						Gamma Statistics						
331					k hat (MLE)	0.525		k star (bias corrected MLE)	0.508			
332					Theta hat (MLE)	793.1		Theta star (bias corrected MLE)	818.9			
333					nu hat (MLE)	57.72		nu star (bias corrected)	55.91			
334					MLE Mean (bias corrected)	416.2		MLE Sd (bias corrected)	583.8			
335								Approximate Chi Square Value (0.05)	39.72			
336					Adjusted Level of Significance	0.0456		Adjusted Chi Square Value	39.36			
337						Assuming Gamma Distribution						
338					95% Approximate Gamma UCL (use when n>=50))	585.8		95% Adjusted Gamma UCL (use when n<50)	591.2			
339						Lognormal GOF Test						
340					Shapiro Wilk Test Statistic	0.905		Shapiro Wilk Lognormal GOF Test				
341					5% Shapiro Wilk P Value	1.8094E-4		Data Not Lognormal at 5% Significance Level				
342					Lilliefors Test Statistic	0.14		Lilliefors Lognormal GOF Test				
343					5% Lilliefors Critical Value	0.119		Data Not Lognormal at 5% Significance Level				
344						Data Not Lognormal at 5% Significance Level						
345						Lognormal Statistics						
346					Minimum of Logged Data	2.549		Mean of logged Data	4.83			
347					Maximum of Logged Data	7.901		SD of logged Data	1.575			
348						Assuming Lognormal Distribution						
349					95% H-UCL	843.9		90% Chebyshev (MVUE) UCL	770.2			
350					95% Chebyshev (MVUE) UCL	932.2		97.5% Chebyshev (MVUE) UCL	1157			
351					99% Chebyshev (MVUE) UCL	1599						
352						Nonparametric Distribution Free UCL Statistics						
353						Data do not follow a Discernible Distribution (0.05)						
354						Nonparametric Distribution Free UCLs						
355					95% CLT UCL	562.3		95% Jackknife UCL	564.8			
356					95% Standard Bootstrap UCL	559.5		95% Bootstrap-t UCL	603.4			
357					95% Hall's Bootstrap UCL	585.9		95% Percentile Bootstrap UCL	561.6			
358					95% BCA Bootstrap UCL	587.1						
359					90% Chebyshev(Mean, Sd) UCL	682.6		95% Chebyshev(Mean, Sd) UCL	803.3			
360					97.5% Chebyshev(Mean, Sd) UCL	970.7		99% Chebyshev(Mean, Sd) UCL	1300			
361						Suggested UCL to Use						
362					95% Chebyshev (Mean, Sd) UCL	803.3						
363												

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
364	Mercury											
365	General Statistics											
366	Total Number of Observations 57 Number of Distinct Observations 57 Number of Missing Observations 0											
367	Minimum 0.00183 Mean 1.02 Maximum 23 Median 0.0439											
368	SD 3.209 Std. Error of Mean 0.425											
369	Coefficient of Variation 3.145 Skewness 6.026											
370	Normal GOF Test											
371	Shapiro Wilk Test Statistic 0.351 Shapiro Wilk GOF Test 5% Shapiro Wilk P Value 0 Data Not Normal at 5% Significance Level											
372	Lilliefors Test Statistic 0.375 Lilliefors GOF Test 5% Lilliefors Critical Value 0.117 Data Not Normal at 5% Significance Level											
373	Data Not Normal at 5% Significance Level											
374	Assuming Normal Distribution											
375	95% Normal UCL 1.731 95% UCLs (Adjusted for Skewness) 95% Student's-t UCL 1.731 95% Adjusted-CLT UCL (Chen-1995) 2.082 95% Modified-t UCL (Johnson-1978) 1.788											
376	Gamma GOF Test											
377	A-D Test Statistic 4.348 Anderson-Darling Gamma GOF Test 5% A-D Critical Value 0.87 Data Not Gamma Distributed at 5% Significance Level											
378	K-S Test Statistic 0.261 Kolmogorov-Smirnov Gamma GOF Test 5% K-S Critical Value 0.128 Data Not Gamma Distributed at 5% Significance Level											
379	Data Not Gamma Distributed at 5% Significance Level											
380	Gamma Statistics											
381	k hat (MLE) 0.287 k star (bias corrected MLE) 0.284 Theta hat (MLE) 3.555 Theta star (bias corrected MLE) 3.598 nu hat (MLE) 32.72 nu star (bias corrected) 32.33 MLE Mean (bias corrected) 1.02 MLE Sd (bias corrected) 1.916 Approximate Chi Square Value (0.05) 20.34											
382	Adjusted Level of Significance 0.0458 Adjusted Chi Square Value 20.09											
383	Assuming Gamma Distribution											
384	95% Approximate Gamma UCL (use when n>=50) 1.622 95% Adjusted Gamma UCL (use when n<50) 1.642											
385	Lognormal GOF Test											
386	Shapiro Wilk Test Statistic 0.93 Shapiro Wilk Lognormal GOF Test 5% Shapiro Wilk P Value 0.00305 Data Not Lognormal at 5% Significance Level											
387	Lilliefors Test Statistic 0.156 Lilliefors Lognormal GOF Test 5% Lilliefors Critical Value 0.117 Data Not Lognormal at 5% Significance Level											
388	Data Not Lognormal at 5% Significance Level											
389	Lognormal Statistics											
390	Minimum of Logged Data -6.303 Mean of logged Data -2.4 Maximum of Logged Data 3.135 SD of logged Data 2.233											
391	Assuming Lognormal Distribution											
392	95% H-UCL 3.806 90% Chebyshev (MVUE) UCL 2.267 95% Chebyshev (MVUE) UCL 2.861 97.5% Chebyshev (MVUE) UCL 3.684 99% Chebyshev (MVUE) UCL 5.301											
393	Nonparametric Distribution Free UCL Statistics											
394	Data do not follow a Discernible Distribution (0.05)											
395	Nonparametric Distribution Free UCLs											
396	95% CLT UCL 1.72 95% Jackknife UCL 1.731 95% Standard Bootstrap UCL 1.718 95% Bootstrap-t UCL 2.916 95% Hall's Bootstrap UCL 4.236 95% Percentile Bootstrap UCL 1.809 95% BCA Bootstrap UCL 2.264											
397	90% Chebyshev(Mean, Sd) UCL 2.296 95% Chebyshev(Mean, Sd) UCL 2.873 97.5% Chebyshev(Mean, Sd) UCL 3.675 99% Chebyshev(Mean, Sd) UCL 5.25											
398	Suggested UCL to Use											
399	95% Chebyshev (Mean, Sd) UCL 2.873											
400	95% Chebyshev (Mean, Sd) UCL 2.873											
401	95% Chebyshev (Mean, Sd) UCL 2.873											
402	95% Chebyshev (Mean, Sd) UCL 2.873											
403	95% Chebyshev (Mean, Sd) UCL 2.873											
404	95% Chebyshev (Mean, Sd) UCL 2.873											
405	95% Chebyshev (Mean, Sd) UCL 2.873											
406	95% Chebyshev (Mean, Sd) UCL 2.873											
407	95% Chebyshev (Mean, Sd) UCL 2.873											
408	95% Chebyshev (Mean, Sd) UCL 2.873											
409	95% Chebyshev (Mean, Sd) UCL 2.873											
410	95% Chebyshev (Mean, Sd) UCL 2.873											
411	95% Chebyshev (Mean, Sd) UCL 2.873											
412	95% Chebyshev (Mean, Sd) UCL 2.873											
413	95% Chebyshev (Mean, Sd) UCL 2.873											
414	95% Chebyshev (Mean, Sd) UCL 2.873											
415	95% Chebyshev (Mean, Sd) UCL 2.873											
416	95% Chebyshev (Mean, Sd) UCL 2.873											
417	95% Chebyshev (Mean, Sd) UCL 2.873											
418	95% Chebyshev (Mean, Sd) UCL 2.873											
419	95% Chebyshev (Mean, Sd) UCL 2.873											
420	95% Chebyshev (Mean, Sd) UCL 2.873											
421	95% Chebyshev (Mean, Sd) UCL 2.873											

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
422												UCL Statistics for Data Sets with Non-Detects
423		User Selected Options										South Pit 0-2 feet bgs ND
424		Date/Time of Computation										ProUCL 5.112/15/2017 5:39:30 PM
425		From File										171215 Summary Tables Soil Statistics_c.xls
426		Full Precision										OFF
427		Confidence Coefficient										95%
428		Number of Bootstrap Operations										2000
429												

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L								
Cadmium																				
General Statistics																				
430 Total Number of Observations			55	Number of Distinct Observations			53													
431				Number of Missing Observations			2													
432 Number of Detects			52	Number of Non-Detects			3													
433 Number of Distinct Detects			50	Number of Distinct Non-Detects			3													
434 Minimum Detect			0.117	Minimum Non-Detect			0.39													
435 Maximum Detect			19.6	Maximum Non-Detect			0.44													
436 Variance Detects			17.29	Percent Non-Detects			5.455%													
437 Mean Detects			2.117	SD Detects			4.158													
438 Median Detects			0.391	CV Detects			1.964													
439 Skewness Detects			2.589	Kurtosis Detects			6.586													
440 Mean of Logged Detects			-0.522	SD of Logged Detects			1.421													
Normal GOF Test on Detects Only																				
441 Shapiro Wilk Test Statistic			0.539	Normal GOF Test on Detected Observations Only																
442 5% Shapiro Wilk P Value			0	Detected Data Not Normal at 5% Significance Level																
443 Lilliefors Test Statistic			0.396	Lilliefors GOF Test																
444 5% Lilliefors Critical Value			0.122	Detected Data Not Normal at 5% Significance Level																
Detected Data Not Normal at 5% Significance Level																				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																				
445 KM Mean			2.014	KM Standard Error of Mean			0.548													
446 KM SD			4.027	95% KM (BCA) UCL			2.993													
447 95% KM (t) UCL			2.932	95% KM (Percentile Bootstrap) UCL			2.943													
448 95% KM (z) UCL			2.916	95% KM Bootstrap t UCL			3.318													
449 90% KM Chebyshev UCL			3.659	95% KM Chebyshev UCL			4.404													
450 97.5% KM Chebyshev UCL			5.439	99% KM Chebyshev UCL			7.47													
Gamma GOF Tests on Detected Observations Only																				
451 A-D Test Statistic			6.38	Anderson-Darling GOF Test																
452 5% A-D Critical Value			0.815	Detected Data Not Gamma Distributed at 5% Significance Level																
453 K-S Test Statistic			0.304	Kolmogorov-Smirnov GOF																
454 5% K-S Critical Value			0.13	Detected Data Not Gamma Distributed at 5% Significance Level																
Detected Data Not Gamma Distributed at 5% Significance Level																				
Gamma Statistics on Detected Data Only																				
455 k hat (MLE)			0.5	k star (bias corrected MLE)			0.484													
456 Theta hat (MLE)			4.238	Theta star (bias corrected MLE)			4.379													
457 nu hat (MLE)			51.95	nu star (bias corrected)			50.29													
458 Mean (detects)			2.117																	
Gamma ROS Statistics using Imputed Non-Detects																				
459 GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																				
460 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																				
461 For such situations, GROS method may yield incorrect values of UCLs and BTVs																				
462 This is especially true when the sample size is small.																				
463 For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																				
464 Minimum			0.01	Mean			2.002													
465 Maximum			19.6	Median			0.362													
466 SD			4.07	CV			2.033													
467 k hat (MLE)			0.449	k star (bias corrected MLE)			0.437													
468 Theta hat (MLE)			4.459	Theta star (bias corrected MLE)			4.585													
469 nu hat (MLE)			49.39	nu star (bias corrected)			48.03													
470 Adjusted Level of Significance (β)			0.0456																	
471 Approximate Chi Square Value (48.03, α)			33.12	Adjusted Chi Square Value (48.03, β)			32.79													
472 95% Gamma Approximate UCL (use when n>=50)			2.903	95% Gamma Adjusted UCL (use when n<50)			2.933													
Estimates of Gamma Parameters using KM Estimates																				
473 Mean (KM)			2.014	SD (KM)			4.027													
474 Variance (KM)			16.22	SE of Mean (KM)			0.548													
475 k hat (KM)			0.25	k star (KM)			0.249													
476 nu hat (KM)			27.52	nu star (KM)			27.35													
477 theta hat (KM)			8.051	theta star (KM)			8.1													
478 80% gamma percentile (KM)			2.92	90% gamma percentile (KM)			6.048													
479 95% gamma percentile (KM)			9.766	99% gamma percentile (KM)			19.67													
Gamma Kaplan-Meier (KM) Statistics																				
480 Approximate Chi Square Value (27.35, α)			16.43	Adjusted Chi Square Value (27.35, β)			16.2													

**South Pit 0-2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
492	95% Gamma Approximate KM-UCL (use when n>=50)				3.354		95% Gamma Adjusted KM-UCL (use when n<50)			3.402		
Lognormal GOF Test on Detected Observations Only												
494	Shapiro Wilk Approximate Test Statistic			0.82								Shapiro Wilk GOF Test
495	5% Shapiro Wilk P Value			3.3791E-8								Detected Data Not Lognormal at 5% Significance Level
496	Lilliefors Test Statistic			0.182								Lilliefors GOF Test
497	5% Lilliefors Critical Value			0.122								Detected Data Not Lognormal at 5% Significance Level
498	Detected Data Not Lognormal at 5% Significance Level											
499	Lognormal ROS Statistics Using Imputed Non-Detects											
500	Mean in Original Scale			2.015								Mean in Log Scale -0.568
501	SD in Original Scale			4.064								SD in Log Scale 1.395
502	95% t UCL (assumes normality of ROS data)			2.932								95% Percentile Bootstrap UCL 2.984
503	95% BCA Bootstrap UCL			3.158								95% Bootstrap t UCL 3.268
504	95% H-UCL (Log ROS)			2.594								
505	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
506	KM Mean (logged)			-0.576								KM Geo Mean 0.562
507	KM SD (logged)			1.389								95% Critical H Value (KM-Log) 2.884
508	KM Standard Error of Mean (logged)			0.189								95% H-UCL (KM -Log) 2.543
509	KM SD (logged)			1.389								95% Critical H Value (KM-Log) 2.884
510	KM Standard Error of Mean (logged)			0.189								
511	DL/2 Statistics											
512	DL/2 Normal				DL/2 Log-Transformed							
513	Mean in Original Scale			2.013								Mean in Log Scale -0.579
514	SD in Original Scale			4.065								SD in Log Scale 1.402
515	95% t UCL (Assumes normality)			2.93								95% H-Stat UCL 2.603
516	DL/2 is not a recommended method, provided for comparisons and historical reasons											
517	Nonparametric Distribution Free UCL Statistics											
518	Data do not follow a Discernible Distribution at 5% Significance Level											
519	Suggested UCL to Use											
520	95% KM (Chebyshev) UCL			4.404								
521												

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	A	B	C	D	E	F	G	H	I	J	K	L							
522	Selenium																		
523	General Statistics																		
524	Total Number of Observations			55	Number of Distinct Observations			50											
525					Number of Missing Observations			2											
526	Number of Detects			42	Number of Non-Detects			13											
527	Number of Distinct Detects			41	Number of Distinct Non-Detects			10											
528	Minimum Detect			0.268	Minimum Non-Detect			0.25											
529	Maximum Detect			3.77	Maximum Non-Detect			2.8											
530	Variance Detects			0.484	Percent Non-Detects			23.64%											
531	Mean Detects			1.008	SD Detects			0.695											
532	Median Detects			0.802	CV Detects			0.69											
533	Skewness Detects			1.903	Kurtosis Detects			4.967											
534	Mean of Logged Detects			-0.182	SD of Logged Detects			0.611											
535	Normal GOF Test on Detects Only																		
536	Shapiro Wilk Test Statistic			0.794	Shapiro Wilk GOF Test														
537	5% Shapiro Wilk Critical Value			0.942	Detected Data Not Normal at 5% Significance Level														
538	Lilliefors Test Statistic			0.172	Lilliefors GOF Test														
539	5% Lilliefors Critical Value			0.135	Detected Data Not Normal at 5% Significance Level														
540	Detected Data Not Normal at 5% Significance Level																		
541	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																		
542	KM Mean			0.931	KM Standard Error of Mean			0.0957											
543	KM SD			0.663	95% KM (BCA) UCL			1.082											
544	95% KM (t) UCL			1.091	95% KM (Percentile Bootstrap) UCL			1.094											
545	95% KM (z) UCL			1.088	95% KM Bootstrap t UCL			1.114											
546	90% KM Chebyshev UCL			1.218	95% KM Chebyshev UCL			1.348											
547	97.5% KM Chebyshev UCL			1.528	99% KM Chebyshev UCL			1.883											
548	Gamma GOF Tests on Detected Observations Only																		
549	A-D Test Statistic			0.644	Anderson-Darling GOF Test														
550	5% A-D Critical Value			0.756	Detected data appear Gamma Distributed at 5% Significance Level														
551	K-S Test Statistic			0.122	Kolmogorov-Smirnov GOF														
552	5% K-S Critical Value			0.138	Detected data appear Gamma Distributed at 5% Significance Level														
553	Detected data appear Gamma Distributed at 5% Significance Level																		
554	Gamma Statistics on Detected Data Only																		
555	k hat (MLE)			2.783	k star (bias corrected MLE)			2.6											
556	Theta hat (MLE)			0.362	Theta star (bias corrected MLE)			0.388											
557	nu hat (MLE)			233.7	nu star (bias corrected)			218.4											
558	Mean (detects)			1.008															
559	Gamma ROS Statistics using Imputed Non-Detects																		
560	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																		
561	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																		
562	For such situations, GROS method may yield incorrect values of UCLs and BTVs																		
563	This is especially true when the sample size is small.																		
564	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																		
565	Minimum			0.01	Mean			0.902											
566	Maximum			3.77	Median			0.765											
567	SD			0.662	CV			0.734											
568	k hat (MLE)			1.68	k star (bias corrected MLE)			1.601											
569	Theta hat (MLE)			0.537	Theta star (bias corrected MLE)			0.564											
570	nu hat (MLE)			184.8	nu star (bias corrected)			176.1											
571	Adjusted Level of Significance (β)			0.0456															
572	Approximate Chi Square Value (176.08, α)			146.4	Adjusted Chi Square Value (176.08, β)			145.7											
573	95% Gamma Approximate UCL (use when n>=50)			1.085	95% Gamma Adjusted UCL (use when n<50)			1.091											
574	Estimates of Gamma Parameters using KM Estimates																		
575	Mean (KM)			0.931	SD (KM)			0.663											
576	Variance (KM)			0.44	SE of Mean (KM)			0.0957											
577	k hat (KM)			1.97	k star (KM)			1.874											
578	nu hat (KM)			216.7	nu star (KM)			206.2											
579	theta hat (KM)			0.473	theta star (KM)			0.497											
580	80% gamma percentile (KM)			1.404	90% gamma percentile (KM)			1.838											
581	95% gamma percentile (KM)			2.254	99% gamma percentile (KM)			3.179											
582	Gamma Kaplan-Meier (KM) Statistics																		
583	Approximate Chi Square Value (206.17, α)			173.9	Adjusted Chi Square Value (206.17, β)			173.2											

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	A	B	C	D	E	F	G	H	I	J	K	L
584	95% Gamma Approximate KM-UCL (use when n>=50)				1.103		95% Gamma Adjusted KM-UCL (use when n<50)			1.108		
Lognormal GOF Test on Detected Observations Only												
586	Shapiro Wilk Test Statistic		0.925									Shapiro Wilk GOF Test
587	5% Shapiro Wilk Critical Value		0.942									Detected Data Not Lognormal at 5% Significance Level
588	Lilliefors Test Statistic		0.0955									Lilliefors GOF Test
589	5% Lilliefors Critical Value		0.135									Detected Data appear Lognormal at 5% Significance Level
590	Detected Data appear Approximate Lognormal at 5% Significance Level											
591	Lognormal ROS Statistics Using Imputed Non-Detects											
592	Mean in Original Scale	0.91										Mean in Log Scale -0.295
593	SD in Original Scale	0.646										SD in Log Scale 0.632
594	95% t UCL (assumes normality of ROS data)	1.055										95% Percentile Bootstrap UCL 1.057
595	95% BCA Bootstrap UCL	1.073										95% Bootstrap t UCL 1.093
596	95% H-UCL (Log ROS)	1.077										
597	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
598	KM Mean (logged)	-0.286										KM Geo Mean 0.751
599	KM SD (logged)	0.648										95% Critical H Value (KM-Log) 1.99
600	KM Standard Error of Mean (logged)	0.0958										95% H-UCL (KM -Log) 1.104
601	KM SD (logged)	0.648										95% Critical H Value (KM-Log) 1.99
602	KM Standard Error of Mean (logged)	0.0958										
603	DL/2 Statistics											
604	DL/2 Normal				DL/2 Log-Transformed							
605	Mean in Original Scale	0.987										Mean in Log Scale -0.235
606	SD in Original Scale	0.656										SD in Log Scale 0.718
607	95% t UCL (Assumes normality)	1.136										95% H-Stat UCL 1.25
608	DL/2 is not a recommended method, provided for comparisons and historical reasons											
609	Nonparametric Distribution Free UCL Statistics											
610	Detected Data appear Gamma Distributed at 5% Significance Level											
611	Suggested UCL to Use											
612	95% KM Approximate Gamma UCL	1.103										95% GROS Approximate Gamma UCL 1.085
613												

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	A	B	C	D	E	F	G	H	I	J	K	L							
773	4,4'-DDT																		
774	General Statistics																		
775	Total Number of Observations			55	Number of Distinct Observations			33											
776					Number of Missing Observations			2											
777	Number of Detects			13	Number of Non-Detects			42											
778	Number of Distinct Detects			13	Number of Distinct Non-Detects			22											
779	Minimum Detect			0.0029	Minimum Non-Detect			5.4000E-4											
780	Maximum Detect			0.088	Maximum Non-Detect			0.064											
781	Variance Detects			5.9745E-4	Percent Non-Detects			76.36%											
782	Mean Detects			0.0348	SD Detects			0.0244											
783	Median Detects			0.032	CV Detects			0.703											
784	Skewness Detects			0.646	Kurtosis Detects			0.317											
785	Mean of Logged Detects			-3.72	SD of Logged Detects			1.053											
786	Normal GOF Test on Detects Only																		
787	Shapiro Wilk Test Statistic			0.953	Shapiro Wilk GOF Test														
788	5% Shapiro Wilk Critical Value			0.866	Detected Data appear Normal at 5% Significance Level														
789	Lilliefors Test Statistic			0.128	Lilliefors GOF Test														
790	5% Lilliefors Critical Value			0.234	Detected Data appear Normal at 5% Significance Level														
791	Detected Data appear Normal at 5% Significance Level																		
792	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																		
793	KM Mean			0.00883	KM Standard Error of Mean			0.00262											
794	KM SD			0.0186	95% KM (BCA) UCL			0.0135											
795	95% KM (t) UCL			0.0132	95% KM (Percentile Bootstrap) UCL			0.0131											
796	95% KM (z) UCL			0.0131	95% KM Bootstrap t UCL			0.0143											
797	90% KM Chebyshev UCL			0.0167	95% KM Chebyshev UCL			0.0203											
798	97.5% KM Chebyshev UCL			0.0252	99% KM Chebyshev UCL			0.0349											
799	Gamma GOF Tests on Detected Observations Only																		
800	A-D Test Statistic			0.362	Anderson-Darling GOF Test														
801	5% A-D Critical Value			0.75	Detected data appear Gamma Distributed at 5% Significance Level														
802	K-S Test Statistic			0.149	Kolmogorov-Smirnov GOF														
803	5% K-S Critical Value			0.241	Detected data appear Gamma Distributed at 5% Significance Level														
804	Detected data appear Gamma Distributed at 5% Significance Level																		
805	Gamma Statistics on Detected Data Only																		
806	k hat (MLE)			1.527	k star (bias corrected MLE)			1.226											
807	Theta hat (MLE)			0.0228	Theta star (bias corrected MLE)			0.0284											
808	nu hat (MLE)			39.71	nu star (bias corrected)			31.88											
809	Mean (detects)			0.0348															
810	Gamma ROS Statistics using Imputed Non-Detects																		
811	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																		
812	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																		
813	For such situations, GROS method may yield incorrect values of UCLs and BTVs																		
814	This is especially true when the sample size is small.																		
815	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																		
816	Minimum			0.0029	Mean			0.0159											
817	Maximum			0.088	Median			0.01											
818	SD			0.0157	CV			0.988											
819	k hat (MLE)			2.136	k star (bias corrected MLE)			2.031											
820	Theta hat (MLE)			0.00743	Theta star (bias corrected MLE)			0.00781											
821	nu hat (MLE)			234.9	nu star (bias corrected)			223.4											
822	Adjusted Level of Significance (β)			0.0456															
823	Approximate Chi Square Value (223.44, α)			189.8	Adjusted Chi Square Value (223.44, β)			189											
824	95% Gamma Approximate UCL (use when n>=50)			0.0187	95% Gamma Adjusted UCL (use when n<50)			0.0187											
825	Estimates of Gamma Parameters using KM Estimates																		
826	Mean (KM)			0.00883	SD (KM)			0.0186											
827	Variance (KM)			3.4424E-4	SE of Mean (KM)			0.00262											
828	k hat (KM)			0.226	k star (KM)			0.226											
829	nu hat (KM)			24.89	nu star (KM)			24.87											
830	theta hat (KM)			0.039	theta star (KM)			0.039											
831	80% gamma percentile (KM)			0.0123	90% gamma percentile (KM)			0.0266											
832	95% gamma percentile (KM)			0.044	99% gamma percentile (KM)			0.0908											
833	Gamma Kaplan-Meier (KM) Statistics																		

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	A	B	C	D	E	F	G	H	I	J	K	L		
834					Approximate Chi Square Value (24.87, α)	14.51				Adjusted Chi Square Value (24.87, β)		14.3		
835					95% Gamma Approximate KM-UCL (use when n>=50)	0.0151			95% Gamma Adjusted KM-UCL (use when n<50)			0.0154		
Lognormal GOF Test on Detected Observations Only														
837					Shapiro Wilk Test Statistic	0.873			Shapiro Wilk GOF Test					
838					5% Shapiro Wilk Critical Value	0.866			Detected Data appear Lognormal at 5% Significance Level					
839					Lilliefors Test Statistic	0.204			Lilliefors GOF Test					
840					5% Lilliefors Critical Value	0.234			Detected Data appear Lognormal at 5% Significance Level					
841					Detected Data appear Lognormal at 5% Significance Level									
842					Lognormal ROS Statistics Using Imputed Non-Detects									
843					Mean in Original Scale	0.00936			Mean in Log Scale			-6.028		
844					SD in Original Scale	0.0184			SD in Log Scale			1.519		
845					95% t UCL (assumes normality of ROS data)	0.0135			95% Percentile Bootstrap UCL			0.0137		
846					95% BCA Bootstrap UCL	0.0143			95% Bootstrap t UCL			0.0155		
847					95% H-UCL (Log ROS)	0.0143								
848					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution									
849					KM Mean (logged)	-6.564			KM Geo Mean			0.00141		
850					KM SD (logged)	1.697			95% Critical H Value (KM-Log)			3.278		
851					KM Standard Error of Mean (logged)	0.246			95% H-UCL (KM -Log)			0.0127		
852					KM SD (logged)	1.697			95% Critical H Value (KM-Log)			3.278		
853					KM Standard Error of Mean (logged)	0.246								
854					DL/2 Statistics									
855					DL/2 Normal			DL/2 Log-Transformed						
856					Mean in Original Scale	0.01			Mean in Log Scale			-5.971		
857					SD in Original Scale	0.0185			SD in Log Scale			1.638		
858					95% t UCL (Assumes normality)	0.0142			95% H-Stat UCL			0.0199		
859					DL/2 is not a recommended method, provided for comparisons and historical reasons									
860					Nonparametric Distribution Free UCL Statistics									
861					Detected Data appear Normal Distributed at 5% Significance Level									
862					Suggested UCL to Use									
863					95% KM (t) UCL	0.0132								
864														

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	A	B	C	D	E	F	G	H	I	J	K	L							
1024	High Molecular Weight PAHs																		
1025	General Statistics																		
1026	Total Number of Observations			55	Number of Distinct Observations			54											
1027					Number of Missing Observations			2											
1028	Number of Detects			52	Number of Non-Detects			3											
1029	Number of Distinct Detects			52	Number of Distinct Non-Detects			3											
1030	Minimum Detect			0.0168	Minimum Non-Detect			0.00565											
1031	Maximum Detect			29.5	Maximum Non-Detect			0.0172											
1032	Variance Detects			16.89	Percent Non-Detects			5.455%											
1033	Mean Detects			1.24	SD Detects			4.11											
1034	Median Detects			0.337	CV Detects			3.316											
1035	Skewness Detects			6.641	Kurtosis Detects			46.13											
1036	Mean of Logged Detects			-1.172	SD of Logged Detects			1.612											
1037	Normal GOF Test on Detects Only																		
1038	Shapiro Wilk Test Statistic			0.282	Normal GOF Test on Detected Observations Only														
1039	5% Shapiro Wilk P Value			0	Detected Data Not Normal at 5% Significance Level														
1040	Lilliefors Test Statistic			0.383	Lilliefors GOF Test														
1041	5% Lilliefors Critical Value			0.122	Detected Data Not Normal at 5% Significance Level														
1042	Detected Data Not Normal at 5% Significance Level																		
1043	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																		
1044	KM Mean			1.172	KM Standard Error of Mean			0.54											
1045	KM SD			3.968	95% KM (BCA) UCL			2.27											
1046	95% KM (t) UCL			2.076	95% KM (Percentile Bootstrap) UCL			2.22											
1047	95% KM (z) UCL			2.061	95% KM Bootstrap t UCL			5.253											
1048	90% KM Chebyshev UCL			2.793	95% KM Chebyshev UCL			3.527											
1049	97.5% KM Chebyshev UCL			4.546	99% KM Chebyshev UCL			6.548											
1050	Gamma GOF Tests on Detected Observations Only																		
1051	A-D Test Statistic			2.282	Anderson-Darling GOF Test														
1052	5% A-D Critical Value			0.823	Detected Data Not Gamma Distributed at 5% Significance Level														
1053	K-S Test Statistic			0.195	Kolmogorov-Smirnov GOF														
1054	5% K-S Critical Value			0.131	Detected Data Not Gamma Distributed at 5% Significance Level														
1055	Detected Data Not Gamma Distributed at 5% Significance Level																		
1056	Gamma Statistics on Detected Data Only																		
1057	k hat (MLE)			0.464	k star (bias corrected MLE)			0.45											
1058	Theta hat (MLE)			2.673	Theta star (bias corrected MLE)			2.756											
1059	nu hat (MLE)			48.22	nu star (bias corrected)			46.77											
1060	Mean (detects)			1.24															
1061	Gamma ROS Statistics using Imputed Non-Detects																		
1062	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																		
1063	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																		
1064	For such situations, GROS method may yield incorrect values of UCLs and BTVs																		
1065	This is especially true when the sample size is small.																		
1066	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																		
1067	Minimum			0.01				Mean	1.172										
1068	Maximum			29.5				Median	0.316										
1069	SD			4.004				CV	3.415										
1070	k hat (MLE)			0.429				k star (bias corrected MLE)	0.417										
1071	Theta hat (MLE)			2.735				Theta star (bias corrected MLE)	2.809										
1072	nu hat (MLE)			47.16				nu star (bias corrected)	45.92										
1073	Adjusted Level of Significance (β)			0.0456															
1074	Approximate Chi Square Value (45.92, α)			31.37	Adjusted Chi Square Value (45.92, β)			31.05											
1075	95% Gamma Approximate UCL (use when n>=50)			1.716	95% Gamma Adjusted UCL (use when n<50)			1.734											
1076	Estimates of Gamma Parameters using KM Estimates																		
1077	Mean (KM)			1.172				SD (KM)	3.968										
1078	Variance (KM)			15.74				SE of Mean (KM)	0.54										
1079	k hat (KM)			0.0873				k star (KM)	0.0946										
1080	nu hat (KM)			9.602				nu star (KM)	10.41										
1081	theta hat (KM)			13.43				theta star (KM)	12.39										
1082	80% gamma percentile (KM)			0.749				90% gamma percentile (KM)	3.046										
1083	95% gamma percentile (KM)			6.822				99% gamma percentile (KM)	19.14										
1084	Gamma Kaplan-Meier (KM) Statistics																		
1085	Approximate Chi Square Value (10.41, α)			4.2				Adjusted Chi Square Value (10.41, β)	4.094										

**South Pit 0-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L						
1086	95% Gamma Approximate KM-UCL (use when n>=50)				2.906		95% Gamma Adjusted KM-UCL (use when n<50)			2.981								
Lognormal GOF Test on Detected Observations Only																		
1088	Shapiro Wilk Approximate Test Statistic			0.971			Shapiro Wilk GOF Test											
1089	5% Shapiro Wilk P Value			0.381			Detected Data appear Lognormal at 5% Significance Level											
1090	Lilliefors Test Statistic			0.0983			Lilliefors GOF Test											
1091	5% Lilliefors Critical Value			0.122			Detected Data appear Lognormal at 5% Significance Level											
Detected Data appear Lognormal at 5% Significance Level																		
Lognormal ROS Statistics Using Imputed Non-Detects																		
1094	Mean in Original Scale			1.172			Mean in Log Scale		-1.375									
1095	SD in Original Scale			4.004			SD in Log Scale		1.785									
1096	95% t UCL (assumes normality of ROS data)			2.076			95% Percentile Bootstrap UCL		2.228									
1097	95% BCA Bootstrap UCL			2.886			95% Bootstrap t UCL		5.338									
1098	95% H-UCL (Log ROS)			2.838														
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																		
1100	KM Mean (logged)			-1.383			KM Geo Mean		0.251									
1101	KM SD (logged)			1.787			95% Critical H Value (KM-Log)		3.398									
1102	KM Standard Error of Mean (logged)			0.244			95% H-UCL (KM -Log)		2.827									
1103	KM SD (logged)			1.787			95% Critical H Value (KM-Log)		3.398									
1104	KM Standard Error of Mean (logged)			0.244														
DL/2 Statistics																		
DL/2 Normal					DL/2 Log-Transformed													
1107	Mean in Original Scale			1.172			Mean in Log Scale		-1.389									
1108	SD in Original Scale			4.004			SD in Log Scale		1.816									
1109	95% t UCL (Assumes normality)			2.076			95% H-Stat UCL		3.037									
1110	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
1111	Nonparametric Distribution Free UCL Statistics																	
1112	Detected Data appear Lognormal Distributed at 5% Significance Level																	
1113	Suggested UCL to Use																	
1114	KM H-UCL			2.827														

**0 - 0.5 feet bgs Soil Analytical Data Summary South Area
Brine Service Company Superfund Site**

Location	Depth	Barium	Cadmium	D_Cadmium	Chromium	Copper	Lead	Nickel	Selenium	D_Selenium	Zinc	Mercury	44-DDD	D_44-DDD	44-DDE	D_44-DDE	44-DDT	D_44-DDT	Dieldrin	D_Dieldrin	Endrin	D_Endrin	HMWPAH	D_HMWPAH
ESSB10	0-0.5 ft	2.03E+02	1.92E-01	1	5.01E+00	6.01E+00	1.04E+01	5.51E+00	1.09E+00	1	2.39E+01	1.15E-02	5.80E-04	0	5.80E-04	0	5.80E-04	0	7.00E-04	0	8.08E-02	1		
ESSB11	0-0.5 ft	2.06E+02	1.17E-01	1	3.47E+00	4.19E+00	7.93E+00	3.31E+00	5.30E-01	0	1.88E+01	1.10E-02	5.40E-04	0	5.40E-04	0	5.40E-04	0	6.40E-04	0	9.36E-02	1		
ESSS01	0-0.5 ft	1.56E+02	1.26E-01	1	3.03E+00	2.91E+00	5.14E+00	3.15E+00	2.50E-01	0	1.28E+01	6.02E-03	5.60E-04	0	5.60E-04	0	5.60E-04	0	6.70E-04	0	1.68E-02	1		
ESSS02	0-0.5 ft	4.67E+02	2.14E-01	1	4.23E+00	5.53E+00	1.05E+01	4.76E+00	3.00E-01	0	2.59E+01	1.33E-02	6.40E-04	0	6.40E-04	0	2.90E-03	1	6.40E-04	0	7.60E-04	0	7.08E-02	1
ESSS03	0-0.5 ft	1.18E+03	1.78E+00	1	1.78E+02	7.03E+01	1.43E+02	9.27E+00	5.71E-01	1	3.83E+02	1.98E+00	1.10E-01	1	3.30E-02	1	3.20E-02	1	5.70E-02	1	2.20E-02	1	1.05E+00	1
ESSS04	0-0.5 ft	3.01E+02	4.00E-01	1	8.38E+00	8.72E+00	2.97E+01	9.00E+00	5.03E-01	1	4.25E+01	4.39E-02	2.90E-03	0	2.90E-03	0	2.90E-03	0	3.50E-03	0	1.79E-01	1		
ESSS05	0-0.5 ft	1.07E+03	5.69E+00	1	3.48E+01	3.99E+01	1.14E+02	7.69E+00	1.70E+00	1	8.11E+02	5.57E+00	6.10E-02	1	5.80E-03	0	3.40E-02	1	5.80E-03	0	7.00E-03	0	1.52E-01	1
ESSS05	0-0.5 ft	1.00E+03	5.73E+00	1	3.14E+01	3.74E+01	1.00E+02	7.34E+00	1.42E+00	1	8.32E+02	2.32E+00	3.00E-02	1	5.80E-03	0	2.50E-02	1	5.80E-03	0	7.00E-03	0	5.92E-01	1
ESSS12	0-0.5 ft	2.24E+02	1.47E-01	1	5.86E+00	6.04E+00	9.33E+00	5.31E+00	1.19E+00	1	1.83E+01	1.24E-02	5.80E-04	0	5.80E-04	0	5.80E-04	0	6.90E-04	0	6.10E-02	1		
SPSS01	0-0.5 ft	2.79E+02	4.10E-01	0	7.45E+00	8.56E+00	1.91E+01	4.92E+00	2.60E+00	0	8.81E+01	4.53E-02	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	9.72E-01	1		
SPSS02	0-0.5 ft	2.90E+02	3.90E-01	0	6.06E+00	1.02E+01	1.39E+01	6.34E+00	2.40E+00	0	4.47E+01	3.44E-02	5.40E-03	0	5.40E-03	0	5.40E-03	0	6.50E-03	0	2.53E-01	1		
SPSS03	0-0.5 ft	2.80E+02	7.57E-01	1	1.76E+01	1.06E+01	6.51E+01	7.09E+00	2.50E+00	0	4.23E+02	2.57E-01	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	6.72E-01	1		
SPSS03	0-0.5 ft	3.05E+02	7.39E-01	1	2.05E+01	1.09E+01	6.11E+01	7.90E+00	2.40E+00	0	4.26E+02	3.98E-01	5.50E-03	0	5.50E-03	0	5.50E-03	0	6.60E-03	0	6.13E-01	1		
SPSS04	0-0.5 ft	2.98E+02	6.68E-01	1	8.81E+01	1.59E+01	2.53E+02	4.18E+00	2.40E+00	0	7.72E+02	9.00E-02	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	2.86E-01	1		
SPSS05	0-0.5 ft	1.19E+02	4.19E-01	1	6.53E+01	6.56E+00	2.77E+02	2.71E+00	2.50E+00	0	2.70E+03	1.06E-01	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	3.52E-01	1		
SPSS06	0-0.5 ft	5.44E+02	6.99E+00	1	2.28E+01	1.05E+02	1.37E+02	1.22E+01	2.70E+00	0	1.95E+03	1.73E+00	2.80E-03	0	2.80E-03	0	2.80E-03	0	3.40E-03	0	2.61E-01	1		
SPSS07	0-0.5 ft	2.80E+02	1.28E+00	1	2.63E+01	1.49E+01	6.14E+01	1.36E+01	2.30E+00	0	7.96E+02	4.88E-01	2.60E-03	0	2.60E-03	0	2.60E-03	0	3.10E-03	0	3.22E-01	1		
SPSS08	0-0.5 ft	2.63E+02	4.40E-01	0	7.07E+00	5.55E+00	1.10E+01	4.79E+00	2.80E+00	0	5.18E+01	4.22E-02	5.70E-04	0	2.10E-03	1	3.40E-03	1	5.70E-04	0	6.90E-04	0	1.32E-01	1
WSS01	0-0.5 ft	1.00E+03	3.43E-01	1	1.02E+01	1.31E+01	5.84E+01	7.20E+00	4.66E-01	1	9.12E+01	2.72E-02	5.70E-03	0	5.70E-03	0	5.70E-03	0	5.70E-03	0	6.80E-03	0	6.15E-01	1
WSS02	0-0.5 ft	5.51E+02	3.97E-01	1	1.28E+01	1.09E+01	3.99E+01	7.56E+00	3.94E-01	1	1.85E+02	4.29E-02	5.90E-03	0	5.90E-03	0	5.90E-03	0	5.90E-03	0	7.10E-03	0	6.74E-01	1
WSS03	0-0.5 ft	1.33E+02	5.89E-01	1	<b																			

South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	User Selected Options	South Pit 0-0.5 feet bgs										
3	Date/Time of Computation	ProUCL 5.112/15/2017 6:11:16 PM										
4	From File	171215 Summary Tables Soil Statistics.xls										
5	Full Precision	OFF										
6	Confidence Coefficient	95%										
7	Number of Bootstrap Operations	2000										
8												

**South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site**

South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L										
71 Chromium																						
72 General Statistics																						
73	Total Number of Observations			23	Number of Distinct Observations			23														
74					Number of Missing Observations			1														
75	Minimum			3.03	Mean			26.04														
76	Maximum			178	Median			11.6														
77	SD			39.01	Std. Error of Mean			8.133														
78	Coefficient of Variation			1.498	Skewness			3.117														
79	Normal GOF Test																					
80	Shapiro Wilk Test Statistic			0.586	Shapiro Wilk GOF Test																	
81	5% Shapiro Wilk Critical Value			0.914	Data Not Normal at 5% Significance Level																	
82	Lilliefors Test Statistic			0.281	Lilliefors GOF Test																	
83	5% Lilliefors Critical Value			0.18	Data Not Normal at 5% Significance Level																	
84	Data Not Normal at 5% Significance Level																					
85	Assuming Normal Distribution																					
86	95% Normal UCL				95% UCLs (Adjusted for Skewness)																	
87	95% Student's-t UCL				40	95% Adjusted-CLT UCL (Chen-1995)			45.06													
88						95% Modified-t UCL (Johnson-1978)			40.88													
89	Gamma GOF Test																					
90	A-D Test Statistic			1.083	Anderson-Darling Gamma GOF Test																	
91	5% A-D Critical Value			0.773	Data Not Gamma Distributed at 5% Significance Level																	
92	K-S Test Statistic			0.164	Kolmogorov-Smirnov Gamma GOF Test																	
93	5% K-S Critical Value			0.187	Detected data appear Gamma Distributed at 5% Significance Level																	
94	Detected data follow Appr. Gamma Distribution at 5% Significance Level																					
95	Gamma Statistics																					
96	k hat (MLE)			0.933	k star (bias corrected MLE)			0.84														
97	Theta hat (MLE)			27.91	Theta star (bias corrected MLE)			30.99														
98	nu hat (MLE)			42.92	nu star (bias corrected)			38.65														
99	MLE Mean (bias corrected)			26.04	MLE Sd (bias corrected)			28.4														
100	Approximate Chi Square Value (0.05)																					
101	Adjusted Level of Significance			0.0389	Adjusted Chi Square Value			24.64														
102	Assuming Gamma Distribution																					
103	95% Approximate Gamma UCL (use when n>=50)			39.6	95% Adjusted Gamma UCL (use when n<50)			40.85														
104	Lognormal GOF Test																					
105	Shapiro Wilk Test Statistic			0.954	Shapiro Wilk Lognormal GOF Test																	
106	5% Shapiro Wilk Critical Value			0.914	Data appear Lognormal at 5% Significance Level																	
107	Lilliefors Test Statistic			0.12	Lilliefors Lognormal GOF Test																	
108	5% Lilliefors Critical Value			0.18	Data appear Lognormal at 5% Significance Level																	
109	Data appear Lognormal at 5% Significance Level																					
110	Lognormal Statistics																					
111	Minimum of Logged Data			1.109	Mean of logged Data			2.636														
112	Maximum of Logged Data			5.182	SD of logged Data			1.056														
113	Assuming Lognormal Distribution																					
114	95% H-UCL			43.76	90% Chebyshev (MVUE) UCL			41.25														
115	95% Chebyshev (MVUE) UCL			49.28	97.5% Chebyshev (MVUE) UCL			60.42														
116	99% Chebyshev (MVUE) UCL			82.32																		
117	Nonparametric Distribution Free UCL Statistics																					
118	Data appear to follow a Discernible Distribution at 5% Significance Level																					
119	Nonparametric Distribution Free UCLs																					
120	95% CLT UCL			39.42	95% Jackknife UCL			40														
121	95% Standard Bootstrap UCL			38.78	95% Bootstrap-t UCL			59.79														
122	95% Hall's Bootstrap UCL			89.55	95% Percentile Bootstrap UCL			40.32														
123	95% BCA Bootstrap UCL			45.31																		
124	90% Chebyshev(Mean, Sd) UCL			50.44	95% Chebyshev(Mean, Sd) UCL			61.49														
125	97.5% Chebyshev(Mean, Sd) UCL			76.83	99% Chebyshev(Mean, Sd) UCL			107														
126	Suggested UCL to Use																					
127	95% Adjusted Gamma UCL			40.85																		
128	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																					
129	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																					
130																						

South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
Copper																			
General Statistics																			
133	Total Number of Observations			23	Number of Distinct Observations			22											
134					Number of Missing Observations			1											
135	Minimum			2.91					Mean			18.56							
136	Maximum			105					Median			10.6							
137	SD			24.2					Std. Error of Mean			5.046							
138	Coefficient of Variation			1.304					Skewness			2.733							
139	Normal GOF Test																		
140	Shapiro Wilk Test Statistic			0.593	Shapiro Wilk GOF Test														
141	5% Shapiro Wilk Critical Value			0.914	Data Not Normal at 5% Significance Level														
142	Lilliefors Test Statistic			0.37	Lilliefors GOF Test														
143	5% Lilliefors Critical Value			0.18	Data Not Normal at 5% Significance Level														
144	Data Not Normal at 5% Significance Level																		
145	Assuming Normal Distribution																		
146	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
147	95% Student's-t UCL			27.22					95% Adjusted-CLT UCL (Chen-1995)			29.93							
148									95% Modified-t UCL (Johnson-1978)			27.7							
149	Gamma GOF Test																		
150	A-D Test Statistic			1.808	Anderson-Darling Gamma GOF Test														
151	5% A-D Critical Value			0.765	Data Not Gamma Distributed at 5% Significance Level														
152	K-S Test Statistic			0.27	Kolmogorov-Smirnov Gamma GOF Test														
153	5% K-S Critical Value			0.186	Data Not Gamma Distributed at 5% Significance Level														
154	Data Not Gamma Distributed at 5% Significance Level																		
155	Gamma Statistics																		
156	k hat (MLE)			1.227					k star (bias corrected MLE)			1.096							
157	Theta hat (MLE)			15.13					Theta star (bias corrected MLE)			16.94							
158	nu hat (MLE)			56.43					nu star (bias corrected)			50.4							
159	MLE Mean (bias corrected)			18.56					MLE Sd (bias corrected)			17.73							
160									Approximate Chi Square Value (0.05)			35.1							
161	Adjusted Level of Significance			0.0389					Adjusted Chi Square Value			34.17							
162	Assuming Gamma Distribution																		
163	95% Approximate Gamma UCL (use when n>=50))			26.65					95% Adjusted Gamma UCL (use when n<50)			27.37							
164	Lognormal GOF Test																		
165	Shapiro Wilk Test Statistic			0.908	Shapiro Wilk Lognormal GOF Test														
166	5% Shapiro Wilk Critical Value			0.914	Data Not Lognormal at 5% Significance Level														
167	Lilliefors Test Statistic			0.189	Lilliefors Lognormal GOF Test														
168	5% Lilliefors Critical Value			0.18	Data Not Lognormal at 5% Significance Level														
169	Data Not Lognormal at 5% Significance Level																		
170	Lognormal Statistics																		
171	Minimum of Logged Data			1.068					Mean of logged Data			2.461							
172	Maximum of Logged Data			4.654					SD of logged Data			0.873							
173	Assuming Lognormal Distribution																		
174	95% H-UCL			26.65					90% Chebyshev (MVUE) UCL			26.91							
175	95% Chebyshev (MVUE) UCL			31.5					97.5% Chebyshev (MVUE) UCL			37.87							
176	99% Chebyshev (MVUE) UCL			50.39															
177	Nonparametric Distribution Free UCL Statistics																		
178	Data do not follow a Discernible Distribution (0.05)																		
179	Nonparametric Distribution Free UCLs																		
180	95% CLT UCL			26.86					95% Jackknife UCL			27.22							
181	95% Standard Bootstrap UCL			26.5					95% Bootstrap-t UCL			36.99							
182	95% Hall's Bootstrap UCL			53.82					95% Percentile Bootstrap UCL			26.97							
183	95% BCA Bootstrap UCL			30.98															
184	90% Chebyshev(Mean, Sd) UCL			33.7					95% Chebyshev(Mean, Sd) UCL			40.56							
185	97.5% Chebyshev(Mean, Sd) UCL			50.07					99% Chebyshev(Mean, Sd) UCL			68.77							
186	Suggested UCL to Use																		
187	95% Chebyshev (Mean, Sd) UCL			40.56															
188																			

South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
Lead																			
General Statistics																			
191	Total Number of Observations			23	Number of Distinct Observations			23											
192					Number of Missing Observations			1											
193	Minimum			5.14					Mean										
194	Maximum			277					Median										
195	SD			79.39					Std. Error of Mean										
196	Coefficient of Variation			1.066					Skewness										
197	Normal GOF Test																		
198	Shapiro Wilk Test Statistic			0.806	Shapiro Wilk GOF Test														
199	5% Shapiro Wilk Critical Value			0.914	Data Not Normal at 5% Significance Level														
200	Lilliefors Test Statistic			0.243	Lilliefors GOF Test														
201	5% Lilliefors Critical Value			0.18	Data Not Normal at 5% Significance Level														
202	Data Not Normal at 5% Significance Level																		
203	Assuming Normal Distribution																		
204	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
205	95% Student's-t UCL			102.9				95% Adjusted-CLT UCL (Chen-1995)	107										
206								95% Modified-t UCL (Johnson-1978)	103.7										
207	Gamma GOF Test																		
208	A-D Test Statistic			0.446	Anderson-Darling Gamma GOF Test														
209	5% A-D Critical Value			0.771	Detected data appear Gamma Distributed at 5% Significance Level														
210	K-S Test Statistic			0.126	Kolmogorov-Smirnov Gamma GOF Test														
211	5% K-S Critical Value			0.187	Detected data appear Gamma Distributed at 5% Significance Level														
212	Detected data appear Gamma Distributed at 5% Significance Level																		
213	Gamma Statistics																		
214	k hat (MLE)			0.961				k star (bias corrected MLE)	0.865										
215	Theta hat (MLE)			77.48				Theta star (bias corrected MLE)	86.12										
216	nu hat (MLE)			44.2				nu star (bias corrected)	39.77										
217	MLE Mean (bias corrected)			74.45				MLE Sd (bias corrected)	80.07										
218	Approximate Chi Square Value (0.05)																		
219	Adjusted Level of Significance			0.0389				Adjusted Chi Square Value	25.53										
220	Assuming Gamma Distribution																		
221	95% Approximate Gamma UCL (use when n>=50)			112.5				95% Adjusted Gamma UCL (use when n<50)	116										
222	Lognormal GOF Test																		
223	Shapiro Wilk Test Statistic			0.951	Shapiro Wilk Lognormal GOF Test														
224	5% Shapiro Wilk Critical Value			0.914	Data appear Lognormal at 5% Significance Level														
225	Lilliefors Test Statistic			0.123	Lilliefors Lognormal GOF Test														
226	5% Lilliefors Critical Value			0.18	Data appear Lognormal at 5% Significance Level														
227	Data appear Lognormal at 5% Significance Level																		
228	Lognormal Statistics																		
229	Minimum of Logged Data			1.637				Mean of logged Data	3.707										
230	Maximum of Logged Data			5.624				SD of logged Data	1.2										
231	Assuming Lognormal Distribution																		
232	95% H-UCL			171.3				90% Chebyshev (MVUE) UCL	149.4										
233	95% Chebyshev (MVUE) UCL			181.1				97.5% Chebyshev (MVUE) UCL	225										
234	99% Chebyshev (MVUE) UCL			311.2															
235	Nonparametric Distribution Free UCL Statistics																		
236	Data appear to follow a Discernible Distribution at 5% Significance Level																		
237	Nonparametric Distribution Free UCLs																		
238	95% CLT UCL			101.7				95% Jackknife UCL	102.9										
239	95% Standard Bootstrap UCL			101				95% Bootstrap-t UCL	110.3										
240	95% Hall's Bootstrap UCL			108.3				95% Percentile Bootstrap UCL	101.6										
241	95% BCA Bootstrap UCL			107.5															
242	90% Chebyshev(Mean, Sd) UCL			124.1				95% Chebyshev(Mean, Sd) UCL	146.6										
243	97.5% Chebyshev(Mean, Sd) UCL			177.8				99% Chebyshev(Mean, Sd) UCL	239.2										
244	Suggested UCL to Use																		
245	95% Adjusted Gamma UCL			116															
246																			

South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L										
Nickel																						
General Statistics																						
249	Total Number of Observations			23	Number of Distinct Observations			23														
250					Number of Missing Observations			1														
251	Minimum			2.71	Mean			6.847														
252	Maximum			13.6	Median			7.09														
253	SD			2.742	Std. Error of Mean			0.572														
254	Coefficient of Variation			0.401	Skewness			0.739														
255	Normal GOF Test																					
256	Shapiro Wilk Test Statistic			0.952	Shapiro Wilk GOF Test																	
257	5% Shapiro Wilk Critical Value			0.914	Data appear Normal at 5% Significance Level																	
258	Lilliefors Test Statistic			0.133	Lilliefors GOF Test																	
259	5% Lilliefors Critical Value			0.18	Data appear Normal at 5% Significance Level																	
260	Data appear Normal at 5% Significance Level																					
261	Assuming Normal Distribution																					
262	95% Normal UCL				95% UCLs (Adjusted for Skewness)																	
263	95% Student's-t UCL				7.829	95% Adjusted-CLT UCL (Chen-1995)			7.882													
264						95% Modified-t UCL (Johnson-1978)			7.844													
265	Gamma GOF Test																					
266	A-D Test Statistic			0.205	Anderson-Darling Gamma GOF Test																	
267	5% A-D Critical Value			0.746	Detected data appear Gamma Distributed at 5% Significance Level																	
268	K-S Test Statistic			0.109	Kolmogorov-Smirnov Gamma GOF Test																	
269	5% K-S Critical Value			0.182	Detected data appear Gamma Distributed at 5% Significance Level																	
270	Detected data appear Gamma Distributed at 5% Significance Level																					
271	Gamma Statistics																					
272	k hat (MLE)			6.533	k star (bias corrected MLE)			5.71														
273	Theta hat (MLE)			1.048	Theta star (bias corrected MLE)			1.199														
274	nu hat (MLE)			300.5	nu star (bias corrected)			262.6														
275	MLE Mean (bias corrected)			6.847	MLE Sd (bias corrected)			2.866														
276	Approximate Chi Square Value (0.05)																					
277	Adjusted Level of Significance			0.0389	Adjusted Chi Square Value			226.1														
278	Assuming Gamma Distribution																					
279	95% Approximate Gamma UCL (use when n>=50)			7.954	95% Adjusted Gamma UCL (use when n<50)			8.041														
280	Lognormal GOF Test																					
281	Shapiro Wilk Test Statistic			0.976	Shapiro Wilk Lognormal GOF Test																	
282	5% Shapiro Wilk Critical Value			0.914	Data appear Lognormal at 5% Significance Level																	
283	Lilliefors Test Statistic			0.13	Lilliefors Lognormal GOF Test																	
284	5% Lilliefors Critical Value			0.18	Data appear Lognormal at 5% Significance Level																	
285	Data appear Lognormal at 5% Significance Level																					
286	Lognormal Statistics																					
287	Minimum of Logged Data			0.997	Mean of logged Data			1.845														
288	Maximum of Logged Data			2.61	SD of logged Data			0.413														
289	Assuming Lognormal Distribution																					
290	95% H-UCL			8.154	90% Chebyshev (MVUE) UCL			8.693														
291	95% Chebyshev (MVUE) UCL			9.519	97.5% Chebyshev (MVUE) UCL			10.67														
292	99% Chebyshev (MVUE) UCL			12.92																		
293	Nonparametric Distribution Free UCL Statistics																					
294	Data appear to follow a Discernible Distribution at 5% Significance Level																					
295	Nonparametric Distribution Free UCLs																					
296	95% CLT UCL			7.788	95% Jackknife UCL			7.829														
297	95% Standard Bootstrap UCL			7.772	95% Bootstrap-t UCL			7.987														
298	95% Hall's Bootstrap UCL			7.981	95% Percentile Bootstrap UCL			7.773														
299	95% BCA Bootstrap UCL			7.827																		
300	90% Chebyshev(Mean, Sd) UCL			8.563	95% Chebyshev(Mean, Sd) UCL			9.34														
301	97.5% Chebyshev(Mean, Sd) UCL			10.42	99% Chebyshev(Mean, Sd) UCL			12.54														
302	Suggested UCL to Use																					
303	95% Student's-t UCL			7.829																		
304																						

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L							
Zinc																			
General Statistics																			
307	Total Number of Observations			23	Number of Distinct Observations			23											
308					Number of Missing Observations			1											
309	Minimum			12.8					Mean			523.8							
310	Maximum			2700					Median			185							
311	SD			707.3					Std. Error of Mean			147.5							
312	Coefficient of Variation			1.35					Skewness			1.884							
313	Normal GOF Test																		
314	Shapiro Wilk Test Statistic			0.739	Shapiro Wilk GOF Test														
315	5% Shapiro Wilk Critical Value			0.914	Data Not Normal at 5% Significance Level														
316	Lilliefors Test Statistic			0.235	Lilliefors GOF Test														
317	5% Lilliefors Critical Value			0.18	Data Not Normal at 5% Significance Level														
318	Data Not Normal at 5% Significance Level																		
319	Assuming Normal Distribution																		
320	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
321	95% Student's-t UCL			777	95% Adjusted-CLT UCL (Chen-1995)			828.2											
322					95% Modified-t UCL (Johnson-1978)			786.7											
323	Gamma GOF Test																		
324	A-D Test Statistic			0.687	Anderson-Darling Gamma GOF Test														
325	5% A-D Critical Value			0.798	Detected data appear Gamma Distributed at 5% Significance Level														
326	K-S Test Statistic			0.189	Kolmogorov-Smirnov Gamma GOF Test														
327	5% K-S Critical Value			0.191	Detected data appear Gamma Distributed at 5% Significance Level														
328	Detected data appear Gamma Distributed at 5% Significance Level																		
329	Gamma Statistics																		
330	k hat (MLE)			0.572					k star (bias corrected MLE)			0.527							
331	Theta hat (MLE)			914.9					Theta star (bias corrected MLE)			994.3							
332	nu hat (MLE)			26.33					nu star (bias corrected)			24.23							
333	MLE Mean (bias corrected)			523.8					MLE Sd (bias corrected)			721.6							
334									Approximate Chi Square Value (0.05)			14.03							
335	Adjusted Level of Significance			0.0389					Adjusted Chi Square Value			13.46							
336	Assuming Gamma Distribution																		
337	95% Approximate Gamma UCL (use when n>=50)			904.9					95% Adjusted Gamma UCL (use when n<50)			942.7							
338	Lognormal GOF Test																		
339	Shapiro Wilk Test Statistic			0.929	Shapiro Wilk Lognormal GOF Test														
340	5% Shapiro Wilk Critical Value			0.914	Data appear Lognormal at 5% Significance Level														
341	Lilliefors Test Statistic			0.155	Lilliefors Lognormal GOF Test														
342	5% Lilliefors Critical Value			0.18	Data appear Lognormal at 5% Significance Level														
343	Data appear Lognormal at 5% Significance Level																		
344	Lognormal Statistics																		
345	Minimum of Logged Data			2.549					Mean of logged Data			5.174							
346	Maximum of Logged Data			7.901					SD of logged Data			1.691							
347	Assuming Lognormal Distribution																		
348	95% H-UCL			2651					90% Chebyshev (MVUE) UCL			1500							
349	95% Chebyshev (MVUE) UCL			1886					97.5% Chebyshev (MVUE) UCL			2423							
350	99% Chebyshev (MVUE) UCL			3476															
351	Nonparametric Distribution Free UCL Statistics																		
352	Data appear to follow a Discernible Distribution at 5% Significance Level																		
353	Nonparametric Distribution Free UCLs																		
354	95% CLT UCL			766.3					95% Jackknife UCL			777							
355	95% Standard Bootstrap UCL			758.9					95% Bootstrap-t UCL			895.3							
356	95% Hall's Bootstrap UCL			888					95% Percentile Bootstrap UCL			785.6							
357	95% BCA Bootstrap UCL			852.3															
358	90% Chebyshev(Mean, Sd) UCL			966.2					95% Chebyshev(Mean, Sd) UCL			1167							
359	97.5% Chebyshev(Mean, Sd) UCL			1445					99% Chebyshev(Mean, Sd) UCL			1991							
360	Suggested UCL to Use																		
361	95% Adjusted Gamma UCL			942.7															
362																			

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
363												
364												
365			Total Number of Observations		24							Number of Distinct Observations
366												24
367												Number of Missing Observations
368												0
369												Mean
370												0.584
371												Median
372												0.0446
373												SD
374												1.25
375												Std. Error of Mean
376												0.255
377												Coefficient of Variation
378												3.181
379												Normal GOF Test
380												
381												Shapiro Wilk GOF Test
382												5% Shapiro Wilk Critical Value
383												0.916
384												Lilliefors Test Statistic
385												0.364
386												5% Lilliefors Critical Value
387												Data Not Normal at 5% Significance Level
388												Assuming Normal Distribution
389												95% Normal UCL
390												95% UCLs (Adjusted for Skewness)
391												95% Student's-t UCL
392												95% Adjusted-CLT UCL (Chen-1995)
393												1.18
394												95% Modified-t UCL (Johnson-1978)
395												1.049
396												Gamma GOF Test
397												A-D Test Statistic
398												0.834
399												Data Not Gamma Distributed at 5% Significance Level
400												K-S Test Statistic
401												0.247
402												5% K-S Critical Value
403												Data Not Gamma Distributed at 5% Significance Level
404												Anderson-Darling Gamma GOF Test
405												95% Approximate Gamma UCL (use when n>=50)
406												1.141
407												95% Adjusted Gamma UCL (use when n<50)
408												1.198
409												Lognormal GOF Test
410												Shapiro Wilk Lognormal GOF Test
411												5% Shapiro Wilk Critical Value
412												0.931
413												Data appear Lognormal at 5% Significance Level
414												Lilliefors Test Statistic
415												0.201
416												5% Lilliefors Critical Value
417												Data Not Lognormal at 5% Significance Level
418												Data appear Approximate Lognormal at 5% Significance Level
419												Nonparametric Distribution Free UCL Statistics
420												Data appear to follow a Discremable Distribution at 5% Significance Level
												Nonparametric Distribution Free UCLs
												95% CLT UCL
												1.004
												95% Jackknife UCL
												1.021
												95% Standard Bootstrap UCL
												0.99
												95% Bootstrap-t UCL
												1.567
												95% Hall's Bootstrap UCL
												2.045
												95% Percentile Bootstrap UCL
												1.045
												95% BCA Bootstrap UCL
												1.225
												90% Chebyshev(Mean, Sd) UCL
												1.349
												95% Chebyshev(Mean, Sd) UCL
												1.696
												97.5% Chebyshev(Mean, Sd) UCL
												2.177
												99% Chebyshev(Mean, Sd) UCL
												3.122
												Suggested UCL to Use
												95% Chebyshev (Mean, Sd) UCL
												1.696

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L										
421	High Molecular Weight PAHs																					
422	General Statistics																					
423	Total Number of Observations			23	Number of Distinct Observations			23														
424					Number of Missing Observations			1														
425	Minimum			0.0168					Mean													
426	Maximum			1.051					Median													
427	SD			0.298					Std. Error of Mean													
428	Coefficient of Variation			0.807					Skewness													
429	Normal GOF Test																					
430	Shapiro Wilk Test Statistic			0.888	Shapiro Wilk GOF Test																	
431	5% Shapiro Wilk Critical Value			0.914	Data Not Normal at 5% Significance Level																	
432	Lilliefors Test Statistic			0.175	Lilliefors GOF Test																	
433	5% Lilliefors Critical Value			0.18	Data appear Normal at 5% Significance Level																	
434	Data appear Approximate Normal at 5% Significance Level																					
435	Assuming Normal Distribution																					
436	95% Normal UCL				95% UCLs (Adjusted for Skewness)																	
437	95% Student's-t UCL				0.476	95% Adjusted-CLT UCL (Chen-1995)			0.484													
438						95% Modified-t UCL (Johnson-1978)			0.478													
439	Gamma GOF Test																					
440	A-D Test Statistic			0.351	Anderson-Darling Gamma GOF Test																	
441	5% A-D Critical Value			0.762	Detected data appear Gamma Distributed at 5% Significance Level																	
442	K-S Test Statistic			0.158	Kolmogorov-Smirnov Gamma GOF Test																	
443	5% K-S Critical Value			0.185	Detected data appear Gamma Distributed at 5% Significance Level																	
444	Detected data appear Gamma Distributed at 5% Significance Level																					
445	Gamma Statistics																					
446	k hat (MLE)			1.38					k star (bias corrected MLE)													
447	Theta hat (MLE)			0.268					Theta star (bias corrected MLE)													
448	nu hat (MLE)			63.46					nu star (bias corrected)													
449	MLE Mean (bias corrected)			0.369					MLE Sd (bias corrected)													
450									Approximate Chi Square Value (0.05)													
451	Adjusted Level of Significance			0.0389					Adjusted Chi Square Value													
452	Assuming Gamma Distribution																					
453	95% Approximate Gamma UCL (use when n>=50))			0.519					95% Adjusted Gamma UCL (use when n<50)													
454	Lognormal GOF Test																					
455	Shapiro Wilk Test Statistic			0.943	Shapiro Wilk Lognormal GOF Test																	
456	5% Shapiro Wilk Critical Value			0.914	Data appear Lognormal at 5% Significance Level																	
457	Lilliefors Test Statistic			0.149	Lilliefors Lognormal GOF Test																	
458	5% Lilliefors Critical Value			0.18	Data appear Lognormal at 5% Significance Level																	
459	Data appear Lognormal at 5% Significance Level																					
460	Lognormal Statistics																					
461	Minimum of Logged Data			-4.086					Mean of logged Data													
462	Maximum of Logged Data			0.0497					SD of logged Data													
463	Assuming Lognormal Distribution																					
464	95% H-UCL			0.743					90% Chebyshev (MVUE) UCL													
465	95% Chebyshev (MVUE) UCL			0.843					97.5% Chebyshev (MVUE) UCL													
466	99% Chebyshev (MVUE) UCL			1.402																		
467	Nonparametric Distribution Free UCL Statistics																					
468	Data appear to follow a Discernible Distribution at 5% Significance Level																					
469	Nonparametric Distribution Free UCLs																					
470	95% CLT UCL			0.472					95% Jackknife UCL													
471	95% Standard Bootstrap UCL			0.47					95% Bootstrap-t UCL													
472	95% Hall's Bootstrap UCL			0.481					95% Percentile Bootstrap UCL													
473	95% BCA Bootstrap UCL			0.487																		
474	90% Chebyshev(Mean, Sd) UCL			0.556					95% Chebyshev(Mean, Sd) UCL													
475	97.5% Chebyshev(Mean, Sd) UCL			0.758					99% Chebyshev(Mean, Sd) UCL													
476	Suggested UCL to Use																					
477	95% Student's-t UCL			0.476																		
478	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																					
479	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																					
480																						

**South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
481												
482		User Selected Options										
483		Date/Time of Computation										
484		From File										
485		Full Precision										
486		Confidence Coefficient										
487		Number of Bootstrap Operations										
488												

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
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South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
551		95% Gamma Approximate KM-UCL (use when n>=50)			2.403			95% Gamma Adjusted KM-UCL (use when n<50)			2.525	
Lognormal GOF Test on Detected Observations Only												
553		Shapiro Wilk Test Statistic			0.923			Shapiro Wilk GOF Test				
554		5% Shapiro Wilk Critical Value			0.905			Detected Data appear Lognormal at 5% Significance Level				
555		Lilliefors Test Statistic			0.138			Lilliefors GOF Test				
556		5% Lilliefors Critical Value			0.192			Detected Data appear Lognormal at 5% Significance Level				
557	Detected Data appear Lognormal at 5% Significance Level											
558	Lognormal ROS Statistics Using Imputed Non-Detects											
559	Mean in Original Scale		1.243					Mean in Log Scale		-0.604		
560	SD in Original Scale		1.991					SD in Log Scale		1.197		
561	95% t UCL (assumes normality of ROS data)		1.956					95% Percentile Bootstrap UCL		2.005		
562	95% BCA Bootstrap UCL		2.119					95% Bootstrap t UCL		2.312		
563	95% H-UCL (Log ROS)		2.285									
564	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
565	KM Mean (logged)		-0.607					KM Geo Mean		0.545		
566	KM SD (logged)		1.184					95% Critical H Value (KM-Log)		2.778		
567	KM Standard Error of Mean (logged)		0.257					95% H-UCL (KM -Log)		2.216		
568	KM SD (logged)		1.184					95% Critical H Value (KM-Log)		2.778		
569	KM Standard Error of Mean (logged)		0.257									
570	DL/2 Statistics											
571	DL/2 Normal				DL/2 Log-Transformed							
572	Mean in Original Scale		1.241					Mean in Log Scale		-0.615		
573	SD in Original Scale		1.992					SD in Log Scale		1.205		
574	95% t UCL (Assumes normality)		1.954					95% H-Stat UCL		2.299		
575	DL/2 is not a recommended method, provided for comparisons and historical reasons											
576	Nonparametric Distribution Free UCL Statistics											
577	Detected Data appear Lognormal Distributed at 5% Significance Level											
578	Suggested UCL to Use											
579	95% KM (Chebyshev) UCL		3.061									
580												

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L						
581							Selenium											
582							General Statistics											
583				Total Number of Observations	23			Number of Distinct Observations	20									
584								Number of Missing Observations	1									
585				Number of Detects	10			Number of Non-Detects	13									
586				Number of Distinct Detects	10			Number of Distinct Non-Detects	10									
587				Minimum Detect	0.394			Minimum Non-Detect	0.25									
588				Maximum Detect	1.7			Maximum Non-Detect	2.8									
589				Variance Detects	0.22			Percent Non-Detects	56.52%									
590				Mean Detects	0.853			SD Detects	0.47									
591				Median Detects	0.685			CV Detects	0.551									
592				Skewness Detects	0.707			Kurtosis Detects	-0.895									
593				Mean of Logged Detects	-0.296			SD of Logged Detects	0.55									
594				Normal GOF Test on Detects Only														
595				Shapiro Wilk Test Statistic	0.882			Shapiro Wilk GOF Test										
596				5% Shapiro Wilk Critical Value	0.842			Detected Data appear Normal at 5% Significance Level										
597				Lilliefors Test Statistic	0.226			Lilliefors GOF Test										
598				5% Lilliefors Critical Value	0.262			Detected Data appear Normal at 5% Significance Level										
599				Detected Data appear Normal at 5% Significance Level														
600				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs														
601				KM Mean	0.688			KM Standard Error of Mean	0.13									
602				KM SD	0.459			95% KM (BCA) UCL	0.91									
603				95% KM (t) UCL	0.911			95% KM (Percentile Bootstrap) UCL	0.915									
604				95% KM (z) UCL	0.901			95% KM Bootstrap t UCL	0.98									
605				90% KM Chebyshev UCL	1.077			95% KM Chebyshev UCL	1.253									
606				97.5% KM Chebyshev UCL	1.497			99% KM Chebyshev UCL	1.977									
607				Gamma GOF Tests on Detected Observations Only														
608				A-D Test Statistic	0.465			Anderson-Darling GOF Test										
609				5% A-D Critical Value	0.73			Detected data appear Gamma Distributed at 5% Significance Level										
610				K-S Test Statistic	0.212			Kolmogorov-Smirnov GOF										
611				5% K-S Critical Value	0.268			Detected data appear Gamma Distributed at 5% Significance Level										
612				Detected data appear Gamma Distributed at 5% Significance Level														
613				Gamma Statistics on Detected Data Only														
614				k hat (MLE)	3.829			k star (bias corrected MLE)	2.747									
615				Theta hat (MLE)	0.223			Theta star (bias corrected MLE)	0.31									
616				nu hat (MLE)	76.59			nu star (bias corrected)	54.95									
617				Mean (detects)	0.853													
618				Gamma ROS Statistics using Imputed Non-Detects														
619				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs														
620				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)														
621				For such situations, GROS method may yield incorrect values of UCLs and BTVs														
622				This is especially true when the sample size is small.														
623				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates														
624				Minimum	0.01			Mean	0.602									
625				Maximum	1.7			Median	0.546									
626				SD	0.439			CV	0.729									
627				k hat (MLE)	1.055			k star (bias corrected MLE)	0.946									
628				Theta hat (MLE)	0.571			Theta star (bias corrected MLE)	0.637									
629				nu hat (MLE)	48.52			nu star (bias corrected)	43.52									
630				Adjusted Level of Significance (β)	0.0389													
631				Approximate Chi Square Value (43.52, α)														
632				Adjusted Chi Square Value (43.52, β)														
633				95% Gamma Approximate UCL (use when n>=50)														
634				0.892														
635				95% Gamma Adjusted UCL (use when n<50)														
636				0.918														
637				Estimates of Gamma Parameters using KM Estimates														
638				Mean (KM)	0.688			SD (KM)	0.459									
639				Variance (KM)	0.211			SE of Mean (KM)	0.13									
640				k hat (KM)	2.248			k star (KM)	1.984									
641				nu hat (KM)	103.4			nu star (KM)	91.27									
642				theta hat (KM)	0.306			theta star (KM)	0.347									
643				80% gamma percentile (KM)	1.031			90% gamma percentile (KM)	1.341									
644				95% gamma percentile (KM)	1.637			99% gamma percentile (KM)	2.292									
645				Gamma Kaplan-Meier (KM) Statistics														
646				Approximate Chi Square Value (91.27, α)	70.24			Adjusted Chi Square Value (91.27, β)	68.9									
647				13 of 110				180106-Summary Tables-Soil Statistics.xlsx										
648																		

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
643	95% Gamma Approximate KM-UCL (use when n>=50)		0.894			95% Gamma Adjusted KM-UCL (use when n<50)					0.912	
Lognormal GOF Test on Detected Observations Only												
645	Shapiro Wilk Test Statistic		0.905				Shapiro Wilk GOF Test					
646	5% Shapiro Wilk Critical Value		0.842			Detected Data appear Lognormal at 5% Significance Level						
647	Lilliefors Test Statistic		0.185				Lilliefors GOF Test					
648	5% Lilliefors Critical Value		0.262			Detected Data appear Lognormal at 5% Significance Level						
649	Detected Data appear Lognormal at 5% Significance Level											
650	Lognormal ROS Statistics Using Imputed Non-Detects											
651	Mean in Original Scale		0.629				Mean in Log Scale		-0.63			
652	SD in Original Scale		0.394				SD in Log Scale		0.587			
653	95% t UCL (assumes normality of ROS data)		0.771				95% Percentile Bootstrap UCL		0.767			
654	95% BCA Bootstrap UCL		0.79				95% Bootstrap t UCL		0.811			
655	95% H-UCL (Log ROS)		0.818									
656	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
657	KM Mean (logged)		-0.584				KM Geo Mean		0.557			
658	KM SD (logged)		0.644				95% Critical H Value (KM-Log)		2.108			
659	KM Standard Error of Mean (logged)		0.183				95% H-UCL (KM -Log)		0.916			
660	KM SD (logged)		0.644				95% Critical H Value (KM-Log)		2.108			
661	KM Standard Error of Mean (logged)		0.183									
662	DL/2 Statistics											
663	DL/2 Normal				DL/2 Log-Transformed							
664	Mean in Original Scale		0.891				Mean in Log Scale		-0.358			
665	SD in Original Scale		0.493				SD in Log Scale		0.821			
666	95% t UCL (Assumes normality)		1.068				95% H-Stat UCL		1.466			
667	DL/2 is not a recommended method, provided for comparisons and historical reasons											
668	Nonparametric Distribution Free UCL Statistics											
669	Detected Data appear Normal Distributed at 5% Significance Level											
670	Suggested UCL to Use											
671	95% KM (t) UCL		0.911									
672												

**South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L						
830							4,4'-DDT											
831							General Statistics											
832				Total Number of Observations	23			Number of Distinct Observations	16									
833								Number of Missing Observations	1									
834				Number of Detects	5			Number of Non-Detects	18									
835				Number of Distinct Detects	5			Number of Distinct Non-Detects	13									
836				Minimum Detect	0.0029			Minimum Non-Detect	5.4000E-4									
837				Maximum Detect	0.034			Maximum Non-Detect	0.0059									
838				Variance Detects	2.3288E-4			Percent Non-Detects	78.26%									
839				Mean Detects	0.0195			SD Detects	0.0153									
840				Median Detects	0.025			CV Detects	0.784									
841				Skewness Detects	-0.407			Kurtosis Detects	-3.111									
842				Mean of Logged Detects	-4.408			SD of Logged Detects	1.244									
843				Normal GOF Test on Detects Only														
844				Shapiro Wilk Test Statistic	0.816			Shapiro Wilk GOF Test										
845				5% Shapiro Wilk Critical Value	0.762			Detected Data appear Normal at 5% Significance Level										
846				Lilliefors Test Statistic	0.254			Lilliefors GOF Test										
847				5% Lilliefors Critical Value	0.343			Detected Data appear Normal at 5% Significance Level										
848				Detected Data appear Normal at 5% Significance Level														
849				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs														
850				KM Mean	0.00479			KM Standard Error of Mean	0.00234									
851				KM SD	0.01			95% KM (BCA) UCL	0.00878									
852				95% KM (t) UCL	0.00881			95% KM (Percentile Bootstrap) UCL	0.00856									
853				95% KM (z) UCL	0.00865			95% KM Bootstrap t UCL	0.00814									
854				90% KM Chebyshev UCL	0.0118			95% KM Chebyshev UCL	0.015									
855				97.5% KM Chebyshev UCL	0.0194			99% KM Chebyshev UCL	0.0281									
856				Gamma GOF Tests on Detected Observations Only														
857				A-D Test Statistic	0.678			Anderson-Darling GOF Test										
858				5% A-D Critical Value	0.689			Detected data appear Gamma Distributed at 5% Significance Level										
859				K-S Test Statistic	0.322			Kolmogorov-Smirnov GOF										
860				5% K-S Critical Value	0.363			Detected data appear Gamma Distributed at 5% Significance Level										
861				Detected data appear Gamma Distributed at 5% Significance Level														
862				Gamma Statistics on Detected Data Only														
863				k hat (MLE)	1.207			k star (bias corrected MLE)	0.616									
864				Theta hat (MLE)	0.0161			Theta star (bias corrected MLE)	0.0316									
865				nu hat (MLE)	12.07			nu star (bias corrected)	6.16									
866				Mean (detects)	0.0195													
867				Gamma ROS Statistics using Imputed Non-Detects														
868				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs														
869				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)														
870				For such situations, GROS method may yield incorrect values of UCLs and BTVs														
871				This is especially true when the sample size is small.														
872				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates														
873				Minimum	0.0029			Mean	0.0121									
874				Maximum	0.034			Median	0.01									
875				SD	0.00763			CV	0.633									
876				k hat (MLE)	3.627			k star (bias corrected MLE)	3.183									
877				Theta hat (MLE)	0.00332			Theta star (bias corrected MLE)	0.00379									
878				nu hat (MLE)	166.9			nu star (bias corrected)	146.4									
879				Adjusted Level of Significance (β)	0.0389													
880				Approximate Chi Square Value (146.43, α)		119.5		Adjusted Chi Square Value (146.43, β)		117.7								
881				95% Gamma Approximate UCL (use when n>=50)		0.0148		95% Gamma Adjusted UCL (use when n<50)		0.015								
882				Estimates of Gamma Parameters using KM Estimates														
883				Mean (KM)	0.00479			SD (KM)	0.01									
884				Variance (KM)	1.0062E-4			SE of Mean (KM)	0.00234									
885				k hat (KM)	0.228			k star (KM)	0.227									
886				nu hat (KM)	10.49			nu star (KM)	10.45									
887				theta hat (KM)	0.021			theta star (KM)	0.0211									
888				80% gamma percentile (KM)	0.0067			90% gamma percentile (KM)	0.0145									
889				95% gamma percentile (KM)	0.0238			99% gamma percentile (KM)	0.0492									
890				Gamma Kaplan-Meier (KM) Statistics														
891				Approximate Chi Square Value (10.45, α)	4.227	15 of 110		Adjusted Chi Square Value (10.45, β)	3.943									

South Pit Soils 0-0.5 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
892		95% Gamma Approximate KM-UCL (use when n>=50)		0.0118			95% Gamma Adjusted KM-UCL (use when n<50)			0.0127		
Lognormal GOF Test on Detected Observations Only												
894		Shapiro Wilk Test Statistic		0.765			Shapiro Wilk GOF Test					
895		5% Shapiro Wilk Critical Value		0.762			Detected Data appear Lognormal at 5% Significance Level					
896		Lilliefors Test Statistic		0.318			Lilliefors GOF Test					
897		5% Lilliefors Critical Value		0.343			Detected Data appear Lognormal at 5% Significance Level					
898	Detected Data appear Lognormal at 5% Significance Level											
899	Lognormal ROS Statistics Using Imputed Non-Detects											
900	Mean in Original Scale	0.00446					Mean in Log Scale	-7.554				
901	SD in Original Scale	0.0104					SD in Log Scale	1.907				
902	95% t UCL (assumes normality of ROS data)	0.00818					95% Percentile Bootstrap UCL	0.00824				
903	95% BCA Bootstrap UCL	0.0091					95% Bootstrap t UCL	0.0105				
904	95% H-UCL (Log ROS)	0.0158										
905	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
906	KM Mean (logged)	-6.754					KM Geo Mean	0.00117				
907	KM SD (logged)	1.396					95% Critical H Value (KM-Log)	3.089				
908	KM Standard Error of Mean (logged)	0.344					95% H-UCL (KM -Log)	0.00775				
909	KM SD (logged)	1.396					95% Critical H Value (KM-Log)	3.089				
910	KM Standard Error of Mean (logged)	0.344										
911	DL/2 Statistics											
912	DL/2 Normal				DL/2 Log-Transformed							
913	Mean in Original Scale	0.00556					Mean in Log Scale	-6.171				
914	SD in Original Scale	0.00996					SD in Log Scale	1.341				
915	95% t UCL (Assumes normality)	0.00912					95% H-Stat UCL	0.0121				
916	DL/2 is not a recommended method, provided for comparisons and historical reasons											
917	Nonparametric Distribution Free UCL Statistics											
918	Detected Data appear Normal Distributed at 5% Significance Level											
919	Suggested UCL to Use											
920	95% KM (t) UCL	0.00881										
921												

**South Pit Soils 0-0.5 feet bgs
Brine Service Company Superfund Site**

**1 - 2 feet bgs Soil Analytical Data Summary South Area
Brine Service Company Superfund Site**

Location	Depth	Barium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Zinc	Mercury	44-DDD	D_44-DDD	44-DDT	D_44-DDT	Dieldrin	D_Dieldrin	Endrin	D_Endrin	HMWPAH	D_HMWPAH
ESSB01	1-2 ft	1.12E+02	1.77E-01	6.90E+00	7.03E+00	1.10E+01	7.23E+00	7.65E-01	2.33E+01	1.49E-02	5.90E-04	0	5.90E-04	0	7.10E-04	0	1.72E-02	0		
ESSB02	1-2 ft	2.16E+02	2.30E-01	8.23E+00	8.39E+00	2.57E+01	9.32E+00	8.20E-01	2.66E+01	1.59E-02	3.00E-03	0	3.00E-03	0	3.00E-03	0	3.60E-03	0	1.90E-02	1
ESSB03	1-2 ft	1.24E+03	1.31E+01	2.16E+02	1.23E+02	2.32E+02	1.29E+01	1.90E+00	1.96E+03	2.95E+00	7.50E-02	1	5.60E-02	1	5.90E-03	0	7.10E-03	0	3.52E+00	1
ESSB03	1-2 ft	1.14E+03	1.30E+01	2.34E+02	1.14E+02	2.54E+02	1.30E+01	2.11E+00	1.76E+03	3.77E+00	6.70E-02	1	4.50E-02	1	5.80E-03	0	6.90E-03	0	1.87E+00	1
ESSB04	1-2 ft	2.25E+02	1.07E+01	6.85E+00	2.34E+02	1.51E+02	9.93E+00	1.74E+00	2.12E+03	4.60E+00	2.70E-03	0	1.90E-02	1	2.70E-03	0	3.30E-03	0	7.20E-01	1
ESSB05	1-2 ft	2.07E+03	4.49E-01	9.21E+01	5.42E+01	8.18E+01	7.28E+00	9.91E-01	1.15E+02	2.22E+00	2.40E-02	1	2.70E-02	1	2.80E-03	0	3.40E-03	0	3.16E-01	1
ESSB06	1-2 ft	2.49E+02	8.19E+00	5.99E+00	3.76E+01	1.01E+02	5.16E+00	3.77E+00	5.51E+02	2.30E+01	5.80E-03	0	5.80E-03	0	5.80E-03	0	6.90E-03	0	1.94E+00	1
ESSB07	1-2 ft	5.82E+02	7.37E-01	7.29E+00	8.36E+00	1.72E+01	6.46E+00	9.56E-01	7.32E+01	2.81E+00	5.70E-03	0	5.70E-03	0	6.80E-03	0	9.82E-02	1		
ESSB08	1-2 ft	2.10E+02	1.93E-01	8.76E+00	7.11E+00	1.17E+01	8.22E+00	1.51E+00	3.04E+01	3.65E-02	6.20E-04	0	6.20E-04	0	7.40E-04	0	1.80E-02	1		
ESSB10	1-2 ft	1.31E+03	3.11E-01	5.83E+00	1.37E+01	8.48E+01	5.55E+00	9.98E-01	7.29E+01	1.74E-02	5.70E-04	0	5.70E-04	0	6.90E-04	0	1.52E-01	1		
ESSB11	1-2 ft	1.14E+03	4.56E-01	7.35E+00	1.21E+01	4.35E+01	6.95E+00	1.43E+00	6.45E+01	1.85E-02	5.60E-04	0	5.60E-04	0	5.60E-04	0	6.70E-04	0	4.07E-02	1
ESSB12	1-2 ft	1.61E+02	1.66E-01	6.01E+00	5.92E+00	8.73E+00	6.54E+00	1.32E+00	1.81E+01	2.44E-02	6.00E-04	0	6.00E-04	0	7.20E-04	0	1.73E-02	1		
ESSB13	1-2 ft	2.28E+02	2.07E-01	3.79E+00	3.87E+00	6.29E+00	2.94E+00	6.56E-01	1.29E+01	1.83E-03	5.70E-04	0	5.70E-04	0	6.80E-04	0	5.65E-03	0		
ESSB14	1-2 ft	1.22E+03	5.08E-01	1.58E+01	1.61E+01	1.27E+02	5.48E+00	2.68E-01	1.64E+02	2.64E-02	1.20E-03	0	1.20E-03	0	1.40E-03	0	9.91E-01	1		
ESSB15	1-2 ft	2.82E+02	3.03E-01	7.27E+00	9.77E+00	3.22E+01	5.87E+00	8.38E-01	5.55E+01	4.05E-03	5.90E-04	0	5.90E-04	0	7.10E-04	0	4.25E-02	1		
ESSS13	1-2 ft										6.03E-02									
SPSB01	1-2 ft	4.88E+02	1.86E-01	7.60E+00	1.72E+01	2.32E+01	5.84E+00	6.23E-01	3.22E+01	1.22E-02	2.90E-03	0	2.90E-03	0	2.90E-03	0	3.40E-03	0	1.69E+00	1
SPSB02	1-2 ft	7.99E+02	3.85E-01	5.00E+01	1.92E+01	8.79E+01	1.04E+01	6.66E-01	7.34E+01	1.09E-01	5.80E-03	0	5.10E-02	1	5.80E-03	0	6.90E-03	0	3.57E-01	1
SPSB03	1-2 ft	1.81E+02	2.14E-01	1.46E+01	8.16E+00	2.06E+01	6.31E+00	4.23E-01	6.11E+01	8.07E-01	5.90E-03	0	5.90E-03	0	5.90E-03	0	7.10E-03	0	1.72E-02	1
SPSB04	1-2 ft	1.43E+03	8.14E-01	1.21E+02	8.90E+01	1.18E+02	1.75E+01	6.34E-01	1.57E+02	4.79E-02	6.40E-02	0	6.40E-02	0	6.40E-02	0	7.70E-02	0	5.36E+00	1
SPSB05	1-2 ft	6.09E+02	9.07E+00	2.10E+01	4.03E+01	1.24E+02	7.59E+00	1.60E+00	1.16E+03	2.20E+00	3.00E-03	0	3.00E-03	0	3.00E-03	0	3.60E-03	0	1.00E+00	1
SPSB06	1-2 ft	2.22E+03	6.96E-01	7.75E+01	6.38E+01	1.42E+02	2.78E+01	1.67E+00	1.90E+02	5.81E-01	3.50E-02	1	5.70E-03	0	3.80E-02	1	2.95E+01	1		
SPSB07	1-2 ft	1.76E+02	2.61E-01	8.55E+00	9.40E+00	9.45E+00	8.39E+00	6.56E-01	5.83E+01	1.08E-01	3.00E-03	0	3.00E-03	0	3.00E-03	0	3.60E-03	0	5.58E-02	1
SPSB08	1-2 ft	2.16E+03	1.96E+01	8.06E+01	1.79E+02	3.59E+02	6.01E+01	2.50E+00	1.54E+03	4.28E-01	4.00E-02	1	5.80E-02	1	5.90E-03	0	7.00E-03	0	7.48E-01	1
SPSB09	1-2 ft	2.41E+02	2.08E-01	1.07E+01	1.32E+01	2.42E+01	5.93E+00	5.00E-01	3.00E+01	3.93E-02	2.70E-02	1	5.80E-03	0	5.80E-03	0	6.90E-03	0	2.05E+00	

**South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2	User Selected Options	South Pit 1-2 feet bgs										
3	Date/Time of Computation	ProUCL 5.112/15/2017 6:14:22 PM										
4	From File	171215 Summary Tables Soil Statistics_a.xls										
5	Full Precision	OFF										
6	Confidence Coefficient	95%										
7	Number of Bootstrap Operations	2000										
8												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
9	Barium											
10	General Statistics											
11												
12	Total Number of Observations		32			Number of Distinct Observations		31				
13						Number of Missing Observations		1				
14	Minimum		90.9			Mean		674				
15	Maximum		2220			Median		339				
16	SD		636.8			Std. Error of Mean		112.6				
17	Coefficient of Variation		0.945			Skewness		1.213				
18	Normal GOF Test											
19	Shapiro Wilk Test Statistic		0.803			Shapiro Wilk GOF Test						
20	5% Shapiro Wilk Critical Value		0.93			Data Not Normal at 5% Significance Level						
21	Lilliefors Test Statistic		0.231			Lilliefors GOF Test						
22	5% Lilliefors Critical Value		0.154			Data Not Normal at 5% Significance Level						
23	Assuming Normal Distribution											
24	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
25	95% Student's-t UCL		864.9			95% Adjusted-CLT UCL (Chen-1995)		885				
26						95% Modified-t UCL (Johnson-1978)		868.9				
27	Gamma GOF Test											
28	A-D Test Statistic		1.313			Anderson-Darling Gamma GOF Test						
29	5% A-D Critical Value		0.769			Data Not Gamma Distributed at 5% Significance Level						
30	K-S Test Statistic		0.212			Kolmogorov-Smirnov Gamma GOF Test						
31	5% K-S Critical Value		0.159			Data Not Gamma Distributed at 5% Significance Level						
32	Data Not Gamma Distributed at 5% Significance Level											
33	Gamma Statistics											
34	k hat (MLE)		1.282			k star (bias corrected MLE)		1.183				
35	Theta hat (MLE)		525.8			Theta star (bias corrected MLE)		570				
36	nu hat (MLE)		82.05			nu star (bias corrected)		75.69				
37	MLE Mean (bias corrected)		674			MLE Sd (bias corrected)		619.8				
38						Approximate Chi Square Value (0.05)		56.65				
39	Adjusted Level of Significance		0.0416			Adjusted Chi Square Value		55.77				
40	Assuming Gamma Distribution											
41	95% Approximate Gamma UCL (use when n>=50))		900.6			95% Adjusted Gamma UCL (use when n<50)		914.8				
42	Lognormal GOF Test											
43	Shapiro Wilk Test Statistic		0.915			Shapiro Wilk Lognormal GOF Test						
44	5% Shapiro Wilk Critical Value		0.93			Data Not Lognormal at 5% Significance Level						
45	Lilliefors Test Statistic		0.187			Lilliefors Lognormal GOF Test						
46	5% Lilliefors Critical Value		0.154			Data Not Lognormal at 5% Significance Level						
47	Data Not Lognormal at 5% Significance Level											
48	Lognormal Statistics											
49	Minimum of Logged Data		4.51			Mean of logged Data		6.075				
50	Maximum of Logged Data		7.705			SD of logged Data		0.963				
51	Assuming Lognormal Distribution											
52	95% H-UCL		1045			90% Chebyshev (MVUE) UCL		1073				
53	95% Chebyshev (MVUE) UCL		1253			97.5% Chebyshev (MVUE) UCL		1501				
54	99% Chebyshev (MVUE) UCL		1990									
55	Nonparametric Distribution Free UCL Statistics											
56	Data do not follow a Discernible Distribution (0.05)											
57	Nonparametric Distribution Free UCLs											
58	95% CLT UCL		859.2			95% Jackknife UCL		864.9				
59	95% Standard Bootstrap UCL		858.5			95% Bootstrap-t UCL		892.3				
60	95% Hall's Bootstrap UCL		893.1			95% Percentile Bootstrap UCL		865.1				
61	95% BCA Bootstrap UCL		869.4									
62	90% Chebyshev(Mean, Sd) UCL		1012			95% Chebyshev(Mean, Sd) UCL		1165				
63	97.5% Chebyshev(Mean, Sd) UCL		1377			99% Chebyshev(Mean, Sd) UCL		1794				
64	Suggested UCL to Use											
65	95% Chebyshev (Mean, Sd) UCL		1165									
66												

South Pit Soil 1-2 feet bgs
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	A	B	C	D	E	F	G	H	I	J	K	L
Chromium												
General Statistics												
69			Total Number of Observations	32			Number of Distinct Observations	32				
70							Number of Missing Observations	1				
71			Minimum	3.79					Mean	34.13		
72			Maximum	234					Median	8.6		
73			SD	58.09					Std. Error of Mean	10.27		
74			Coefficient of Variation	1.702					Skewness	2.564		
75			Normal GOF Test									
76			Shapiro Wilk Test Statistic	0.557			Shapiro Wilk GOF Test					
77			5% Shapiro Wilk Critical Value	0.93			Data Not Normal at 5% Significance Level					
78			Lilliefors Test Statistic	0.374			Lilliefors GOF Test					
79			5% Lilliefors Critical Value	0.154			Data Not Normal at 5% Significance Level					
80			Data Not Normal at 5% Significance Level									
81			Assuming Normal Distribution									
82			95% Normal UCL		95% UCLs (Adjusted for Skewness)							
83			95% Student's-t UCL	51.54			95% Adjusted-CLT UCL (Chen-1995)	55.99				
84							95% Modified-t UCL (Johnson-1978)	52.31				
85			Gamma GOF Test									
86			A-D Test Statistic	3.988			Anderson-Darling Gamma GOF Test					
87			5% A-D Critical Value	0.793			Data Not Gamma Distributed at 5% Significance Level					
88			K-S Test Statistic	0.309			Kolmogorov-Smirnov Gamma GOF Test					
89			5% K-S Critical Value	0.162			Data Not Gamma Distributed at 5% Significance Level					
90			Data Not Gamma Distributed at 5% Significance Level									
91			Gamma Statistics									
92			k hat (MLE)	0.697			k star (bias corrected MLE)	0.652				
93			Theta hat (MLE)	48.98			Theta star (bias corrected MLE)	52.32				
94			nu hat (MLE)	44.59			nu star (bias corrected)	41.75				
95			MLE Mean (bias corrected)	34.13			MLE Sd (bias corrected)	42.26				
96							Approximate Chi Square Value (0.05)	27.94				
97			Adjusted Level of Significance	0.0416			Adjusted Chi Square Value	27.33				
98			Assuming Gamma Distribution									
99			95% Approximate Gamma UCL (use when n>=50))	51			95% Adjusted Gamma UCL (use when n<50)	52.13				
100			Lognormal GOF Test									
101			Shapiro Wilk Test Statistic	0.803			Shapiro Wilk Lognormal GOF Test					
102			5% Shapiro Wilk Critical Value	0.93			Data Not Lognormal at 5% Significance Level					
103			Lilliefors Test Statistic	0.255			Lilliefors Lognormal GOF Test					
104			5% Lilliefors Critical Value	0.154			Data Not Lognormal at 5% Significance Level					
105			Data Not Lognormal at 5% Significance Level									
106			Lognormal Statistics									
107			Minimum of Logged Data	1.332			Mean of logged Data	2.662				
108			Maximum of Logged Data	5.455			SD of logged Data	1.171				
109			Assuming Lognormal Distribution									
110			95% H-UCL	49.61			90% Chebyshev (MVUE) UCL	47.9				
111			95% Chebyshev (MVUE) UCL	57.15			97.5% Chebyshev (MVUE) UCL	69.98				
112			99% Chebyshev (MVUE) UCL	95.18								
113			Nonparametric Distribution Free UCL Statistics									
114			Data do not follow a Discernible Distribution (0.05)									
115			Nonparametric Distribution Free UCLs									
116			95% CLT UCL	51.02			95% Jackknife UCL	51.54				
117			95% Standard Bootstrap UCL	50.89			95% Bootstrap-t UCL	61.54				
118			95% Hall's Bootstrap UCL	60.96			95% Percentile Bootstrap UCL	51.67				
119			95% BCA Bootstrap UCL	56.94								
120			90% Chebyshev(Mean, Sd) UCL	64.93			95% Chebyshev(Mean, Sd) UCL	78.89				
121			97.5% Chebyshev(Mean, Sd) UCL	98.26			99% Chebyshev(Mean, Sd) UCL	136.3				
122			Suggested UCL to Use									
123			95% Chebyshev (Mean, Sd) UCL	78.89								
124												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Copper												
General Statistics												
127			Total Number of Observations	32			Number of Distinct Observations	32				
128							Number of Missing Observations	1				
129			Minimum	3.87					Mean	36.14		
130			Maximum	234					Median	10.69		
131			SD	54.94					Std. Error of Mean	9.712		
132			Coefficient of Variation	1.52					Skewness	2.388		
Normal GOF Test												
134			Shapiro Wilk Test Statistic	0.618			Shapiro Wilk GOF Test					
135			5% Shapiro Wilk Critical Value	0.93			Data Not Normal at 5% Significance Level					
136			Lilliefors Test Statistic	0.34			Lilliefors GOF Test					
137			5% Lilliefors Critical Value	0.154			Data Not Normal at 5% Significance Level					
Data Not Normal at 5% Significance Level												
Assuming Normal Distribution												
140			95% Normal UCL				95% UCLs (Adjusted for Skewness)					
141			95% Student's-t UCL	52.61			95% Adjusted-CLT UCL (Chen-1995)	56.5				
142							95% Modified-t UCL (Johnson-1978)	53.29				
Gamma GOF Test												
144			A-D Test Statistic	2.92			Anderson-Darling Gamma GOF Test					
145			5% A-D Critical Value	0.786			Data Not Gamma Distributed at 5% Significance Level					
146			K-S Test Statistic	0.263			Kolmogorov-Smirnov Gamma GOF Test					
147			5% K-S Critical Value	0.161			Data Not Gamma Distributed at 5% Significance Level					
Data Not Gamma Distributed at 5% Significance Level												
Gamma Statistics												
150			k hat (MLE)	0.784			k star (bias corrected MLE)	0.731				
151			Theta hat (MLE)	46.12			Theta star (bias corrected MLE)	49.44				
152			nu hat (MLE)	50.15			nu star (bias corrected)	46.79				
153			MLE Mean (bias corrected)	36.14			MLE Sd (bias corrected)	42.27				
154							Approximate Chi Square Value (0.05)	32.09				
155			Adjusted Level of Significance	0.0416			Adjusted Chi Square Value	31.44				
Assuming Gamma Distribution												
157			95% Approximate Gamma UCL (use when n>=50))	52.69			95% Adjusted Gamma UCL (use when n<50)	53.78				
Lognormal GOF Test												
159			Shapiro Wilk Test Statistic	0.859			Shapiro Wilk Lognormal GOF Test					
160			5% Shapiro Wilk Critical Value	0.93			Data Not Lognormal at 5% Significance Level					
161			Lilliefors Test Statistic	0.198			Lilliefors Lognormal GOF Test					
162			5% Lilliefors Critical Value	0.154			Data Not Lognormal at 5% Significance Level					
Data Not Lognormal at 5% Significance Level												
Lognormal Statistics												
165			Minimum of Logged Data	1.353			Mean of logged Data	2.828				
166			Maximum of Logged Data	5.455			SD of logged Data	1.139				
Assuming Lognormal Distribution												
168			95% H-UCL	55.04			90% Chebyshev (MVUE) UCL	53.78				
169			95% Chebyshev (MVUE) UCL	63.95			97.5% Chebyshev (MVUE) UCL	78.06				
170			99% Chebyshev (MVUE) UCL	105.8								
Nonparametric Distribution Free UCL Statistics												
Data do not follow a Discernible Distribution (0.05)												
Nonparametric Distribution Free UCLs												
174			95% CLT UCL	52.12			95% Jackknife UCL	52.61				
175			95% Standard Bootstrap UCL	51.8			95% Bootstrap-t UCL	61.6				
176			95% Hall's Bootstrap UCL	60.3			95% Percentile Bootstrap UCL	53.82				
177			95% BCA Bootstrap UCL	56.13								
178			90% Chebyshev(Mean, Sd) UCL	65.28			95% Chebyshev(Mean, Sd) UCL	78.48				
179			97.5% Chebyshev(Mean, Sd) UCL	96.79			99% Chebyshev(Mean, Sd) UCL	132.8				
Suggested UCL to Use												
181			95% Chebyshev (Mean, Sd) UCL	78.48								
182												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

A	B	C	D	E	F	G	H	I	J	K	L	
Lead												
General Statistics												
185	Total Number of Observations	32		Number of Distinct Observations	31							
186				Number of Missing Observations	1							
187	Minimum	6.29				Mean	72.21					
188	Maximum	359				Median	29.75					
189	SD	83.23				Std. Error of Mean	14.71					
190	Coefficient of Variation	1.153				Skewness	1.907					
Normal GOF Test												
192	Shapiro Wilk Test Statistic	0.76		Shapiro Wilk GOF Test								
193	5% Shapiro Wilk Critical Value	0.93		Data Not Normal at 5% Significance Level								
194	Lilliefors Test Statistic	0.239		Lilliefors GOF Test								
195	5% Lilliefors Critical Value	0.154		Data Not Normal at 5% Significance Level								
Data Not Normal at 5% Significance Level												
Assuming Normal Distribution												
198	95% Normal UCL			95% UCLs (Adjusted for Skewness)								
199	95% Student's-t UCL	97.15		95% Adjusted-CLT UCL (Chen-1995)	101.7							
200				95% Modified-t UCL (Johnson-1978)	97.98							
Gamma GOF Test												
202	A-D Test Statistic	0.924		Anderson-Darling Gamma GOF Test								
203	5% A-D Critical Value	0.777		Data Not Gamma Distributed at 5% Significance Level								
204	K-S Test Statistic	0.18		Kolmogorov-Smirnov Gamma GOF Test								
205	5% K-S Critical Value	0.16		Data Not Gamma Distributed at 5% Significance Level								
Data Not Gamma Distributed at 5% Significance Level												
Gamma Statistics												
208	k hat (MLE)	0.968		k star (bias corrected MLE)	0.898							
209	Theta hat (MLE)	74.62		Theta star (bias corrected MLE)	80.43							
210	nu hat (MLE)	61.93		nu star (bias corrected)	57.46							
211	MLE Mean (bias corrected)	72.21		MLE Sd (bias corrected)	76.21							
212				Approximate Chi Square Value (0.05)	41.03							
213	Adjusted Level of Significance	0.0416		Adjusted Chi Square Value	40.29							
Assuming Gamma Distribution												
215	95% Approximate Gamma UCL (use when n>=50))	101.1		95% Adjusted Gamma UCL (use when n<50)	103							
Lognormal GOF Test												
217	Shapiro Wilk Test Statistic	0.949		Shapiro Wilk Lognormal GOF Test								
218	5% Shapiro Wilk Critical Value	0.93		Data appear Lognormal at 5% Significance Level								
219	Lilliefors Test Statistic	0.129		Lilliefors Lognormal GOF Test								
220	5% Lilliefors Critical Value	0.154		Data appear Lognormal at 5% Significance Level								
Data appear Lognormal at 5% Significance Level												
Lognormal Statistics												
223	Minimum of Logged Data	1.839		Mean of logged Data	3.681							
224	Maximum of Logged Data	5.883		SD of logged Data	1.133							
Assuming Lognormal Distribution												
226	95% H-UCL	127.9		90% Chebyshev (MVUE) UCL	125.2							
227	95% Chebyshev (MVUE) UCL	148.8		97.5% Chebyshev (MVUE) UCL	181.5							
228	99% Chebyshev (MVUE) UCL	245.9										
Nonparametric Distribution Free UCL Statistics												
Data appear to follow a Discremable Distribution at 5% Significance Level												
Nonparametric Distribution Free UCLs												
232	95% CLT UCL	96.41		95% Jackknife UCL	97.15							
233	95% Standard Bootstrap UCL	96.09		95% Bootstrap-t UCL	107.8							
234	95% Hall's Bootstrap UCL	107.3		95% Percentile Bootstrap UCL	99.07							
235	95% BCA Bootstrap UCL	102.2										
236	90% Chebyshev(Mean, Sd) UCL	116.3		95% Chebyshev(Mean, Sd) UCL	136.3							
237	97.5% Chebyshev(Mean, Sd) UCL	164.1		99% Chebyshev(Mean, Sd) UCL	218.6							
Suggested UCL to Use												
239	95% H-UCL	127.9										
ProUCL computes and outputs H-statistic based UCLs for historical reasons only.												
241	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
242	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
243	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
244												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Nickel												
General Statistics												
247	Total Number of Observations		32				Number of Distinct Observations	30				
248							Number of Missing Observations	1				
249			Minimum	2.94					Mean	9.676		
250			Maximum	60.1					Median	6.745		
251			SD	10.32					Std. Error of Mean	1.824		
252			Coefficient of Variation	1.067					Skewness	4.167		
Normal GOF Test												
254	Shapiro Wilk Test Statistic	0.498					Shapiro Wilk GOF Test					
255	5% Shapiro Wilk Critical Value	0.93					Data Not Normal at 5% Significance Level					
256	Lilliefors Test Statistic	0.316					Lilliefors GOF Test					
257	5% Lilliefors Critical Value	0.154					Data Not Normal at 5% Significance Level					
Data Not Normal at 5% Significance Level												
Assuming Normal Distribution												
260	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
261	95% Student's-t UCL	12.77					95% Adjusted-CLT UCL (Chen-1995)	14.11				
262							95% Modified-t UCL (Johnson-1978)	12.99				
Gamma GOF Test												
264	A-D Test Statistic	2.559					Anderson-Darling Gamma GOF Test					
265	5% A-D Critical Value	0.757					Data Not Gamma Distributed at 5% Significance Level					
266	K-S Test Statistic	0.214					Kolmogorov-Smirnov Gamma GOF Test					
267	5% K-S Critical Value	0.157					Data Not Gamma Distributed at 5% Significance Level					
Data Not Gamma Distributed at 5% Significance Level												
Gamma Statistics												
270	k hat (MLE)	2.321					k star (bias corrected MLE)	2.124				
271	Theta hat (MLE)	4.169					Theta star (bias corrected MLE)	4.555				
272	nu hat (MLE)	148.5					nu star (bias corrected)	136				
273	MLE Mean (bias corrected)	9.676					MLE Sd (bias corrected)	6.638				
274							Approximate Chi Square Value (0.05)	110				
275	Adjusted Level of Significance	0.0416					Adjusted Chi Square Value	108.8				
Assuming Gamma Distribution												
277	95% Approximate Gamma UCL (use when n>=50))	11.96					95% Adjusted Gamma UCL (use when n<50)	12.09				
Lognormal GOF Test												
279	Shapiro Wilk Test Statistic	0.869					Shapiro Wilk Lognormal GOF Test					
280	5% Shapiro Wilk Critical Value	0.93					Data Not Lognormal at 5% Significance Level					
281	Lilliefors Test Statistic	0.165					Lilliefors Lognormal GOF Test					
282	5% Lilliefors Critical Value	0.154					Data Not Lognormal at 5% Significance Level					
Data Not Lognormal at 5% Significance Level												
Lognormal Statistics												
285	Minimum of Logged Data	1.078					Mean of logged Data	2.039				
286	Maximum of Logged Data	4.096					SD of logged Data	0.581				
Assuming Lognormal Distribution												
288	95% H-UCL	11.21					90% Chebyshev (MVUE) UCL	11.99				
289	95% Chebyshev (MVUE) UCL	13.33					97.5% Chebyshev (MVUE) UCL	15.19				
290	99% Chebyshev (MVUE) UCL	18.83										
Nonparametric Distribution Free UCL Statistics												
Data do not follow a Discernible Distribution (0.05)												
Nonparametric Distribution Free UCLs												
294	95% CLT UCL	12.68					95% Jackknife UCL	12.77				
295	95% Standard Bootstrap UCL	12.63					95% Bootstrap-t UCL	18.83				
296	95% Hall's Bootstrap UCL	25.24					95% Percentile Bootstrap UCL	12.76				
297	95% BCA Bootstrap UCL	14.7										
298	90% Chebyshev(Mean, Sd) UCL	15.15					95% Chebyshev(Mean, Sd) UCL	17.63				
299	97.5% Chebyshev(Mean, Sd) UCL	21.07					99% Chebyshev(Mean, Sd) UCL	27.83				
Suggested UCL to Use												
301	95% Chebyshev (Mean, Sd) UCL	17.63										
302												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Zinc												
General Statistics												
305	Total Number of Observations		32				Number of Distinct Observations	32				
306							Number of Missing Observations	1				
307			Minimum	12.9					Mean	338.9		
308			Maximum	2120					Median	68.7		
309			SD	621					Std. Error of Mean	109.8		
310			Coefficient of Variation	1.832					Skewness	2.085		
Normal GOF Test												
312	Shapiro Wilk Test Statistic	0.552					Shapiro Wilk GOF Test					
313	5% Shapiro Wilk Critical Value	0.93					Data Not Normal at 5% Significance Level					
314	Lilliefors Test Statistic	0.407					Lilliefors GOF Test					
315	5% Lilliefors Critical Value	0.154					Data Not Normal at 5% Significance Level					
316	Data Not Normal at 5% Significance Level											
317	Assuming Normal Distribution											
318	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
319	95% Student's-t UCL	525				95% Adjusted-CLT UCL (Chen-1995)	562.7					
320						95% Modified-t UCL (Johnson-1978)	531.8					
321	Gamma GOF Test											
322	A-D Test Statistic	3.432					Anderson-Darling Gamma GOF Test					
323	5% A-D Critical Value	0.81					Data Not Gamma Distributed at 5% Significance Level					
324	K-S Test Statistic	0.283					Kolmogorov-Smirnov Gamma GOF Test					
325	5% K-S Critical Value	0.164					Data Not Gamma Distributed at 5% Significance Level					
326	Data Not Gamma Distributed at 5% Significance Level											
327	Gamma Statistics											
328	k hat (MLE)	0.509					k star (bias corrected MLE)	0.482				
329	Theta hat (MLE)	665.3					Theta star (bias corrected MLE)	702.4				
330	nu hat (MLE)	32.6					nu star (bias corrected)	30.88				
331	MLE Mean (bias corrected)	338.9					MLE Sd (bias corrected)	487.9				
332							Approximate Chi Square Value (0.05)	19.18				
333	Adjusted Level of Significance	0.0416					Adjusted Chi Square Value	18.69				
334	Assuming Gamma Distribution											
335	95% Approximate Gamma UCL (use when n>=50))	545.5					95% Adjusted Gamma UCL (use when n<50)	559.9				
336	Lognormal GOF Test											
337	Shapiro Wilk Test Statistic	0.869					Shapiro Wilk Lognormal GOF Test					
338	5% Shapiro Wilk Critical Value	0.93					Data Not Lognormal at 5% Significance Level					
339	Lilliefors Test Statistic	0.174					Lilliefors Lognormal GOF Test					
340	5% Lilliefors Critical Value	0.154					Data Not Lognormal at 5% Significance Level					
341	Data Not Lognormal at 5% Significance Level											
342	Lognormal Statistics											
343	Minimum of Logged Data	2.557					Mean of logged Data	4.582				
344	Maximum of Logged Data	7.659					SD of logged Data	1.463				
345	Assuming Lognormal Distribution											
346	95% H-UCL	633.6					90% Chebyshev (MVUE) UCL	529.7				
347	95% Chebyshev (MVUE) UCL	648.5					97.5% Chebyshev (MVUE) UCL	813.4				
348	99% Chebyshev (MVUE) UCL	1137										
349	Nonparametric Distribution Free UCL Statistics											
350	Data do not follow a Discernible Distribution (0.05)											
351	Nonparametric Distribution Free UCLs											
352	95% CLT UCL	519.5					95% Jackknife UCL	525				
353	95% Standard Bootstrap UCL	515.5					95% Bootstrap-t UCL	616.3				
354	95% Hall's Bootstrap UCL	505.5					95% Percentile Bootstrap UCL	532.7				
355	95% BCA Bootstrap UCL	565.9										
356	90% Chebyshev(Mean, Sd) UCL	668.2					95% Chebyshev(Mean, Sd) UCL	817.4				
357	97.5% Chebyshev(Mean, Sd) UCL	1024					99% Chebyshev(Mean, Sd) UCL	1431				
358	Suggested UCL to Use											
359	95% Chebyshev (Mean, Sd) UCL	817.4										
360												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Mercury												
General Statistics												
363			Total Number of Observations	33			Number of Distinct Observations	33				
364							Number of Missing Observations	0				
365			Minimum	0.00183					Mean	1.338		
366			Maximum	23					Median	0.0393		
367			SD	4.081					Std. Error of Mean	0.71		
368			Coefficient of Variation	3.05					Skewness	4.978		
369	Normal GOF Test											
370			Shapiro Wilk Test Statistic	0.361			Shapiro Wilk GOF Test					
371			5% Shapiro Wilk Critical Value	0.931			Data Not Normal at 5% Significance Level					
372			Lilliefors Test Statistic	0.372			Lilliefors GOF Test					
373			5% Lilliefors Critical Value	0.152			Data Not Normal at 5% Significance Level					
374	Data Not Normal at 5% Significance Level											
375	Assuming Normal Distribution											
376	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
377			95% Student's-t UCL	2.541			95% Adjusted-CLT UCL (Chen-1995)	3.164				
378							95% Modified-t UCL (Johnson-1978)	2.644				
379	Gamma GOF Test											
380			A-D Test Statistic	2.782			Anderson-Darling Gamma GOF Test					
381			5% A-D Critical Value	0.878			Data Not Gamma Distributed at 5% Significance Level					
382			K-S Test Statistic	0.289			Kolmogorov-Smirnov Gamma GOF Test					
383			5% K-S Critical Value	0.168			Data Not Gamma Distributed at 5% Significance Level					
384	Data Not Gamma Distributed at 5% Significance Level											
385	Gamma Statistics											
386			k hat (MLE)	0.256			k star (bias corrected MLE)	0.253				
387			Theta hat (MLE)	5.223			Theta star (bias corrected MLE)	5.287				
388			nu hat (MLE)	16.91			nu star (bias corrected)	16.7				
389			MLE Mean (bias corrected)	1.338			MLE Sd (bias corrected)	2.659				
390							Approximate Chi Square Value (0.05)	8.46				
391			Adjusted Level of Significance	0.0419			Adjusted Chi Square Value	8.158				
392	Assuming Gamma Distribution											
393			95% Approximate Gamma UCL (use when n>=50))	2.641			95% Adjusted Gamma UCL (use when n<50)	2.739				
394	Lognormal GOF Test											
395			Shapiro Wilk Test Statistic	0.919			Shapiro Wilk Lognormal GOF Test					
396			5% Shapiro Wilk Critical Value	0.931			Data Not Lognormal at 5% Significance Level					
397			Lilliefors Test Statistic	0.156			Lilliefors Lognormal GOF Test					
398			5% Lilliefors Critical Value	0.152			Data Not Lognormal at 5% Significance Level					
399	Data Not Lognormal at 5% Significance Level											
400	Lognormal Statistics											
401			Minimum of Logged Data	-6.303			Mean of logged Data	-2.471				
402			Maximum of Logged Data	3.135			SD of logged Data	2.455				
403	Assuming Lognormal Distribution											
404			95% H-UCL	12.47			90% Chebyshev (MVUE) UCL	3.575				
405			95% Chebyshev (MVUE) UCL	4.617			97.5% Chebyshev (MVUE) UCL	6.063				
406			99% Chebyshev (MVUE) UCL	8.905								
407	Nonparametric Distribution Free UCL Statistics											
408	Data do not follow a Discernible Distribution (0.05)											
409	Nonparametric Distribution Free UCLs											
410			95% CLT UCL	2.506			95% Jackknife UCL	2.541				
411			95% Standard Bootstrap UCL	2.474			95% Bootstrap-t UCL	5.16				
412			95% Hall's Bootstrap UCL	6.416			95% Percentile Bootstrap UCL	2.667				
413			95% BCA Bootstrap UCL	3.438								
414			90% Chebyshev(Mean, Sd) UCL	3.469			95% Chebyshev(Mean, Sd) UCL	4.434				
415			97.5% Chebyshev(Mean, Sd) UCL	5.774			99% Chebyshev(Mean, Sd) UCL	8.406				
416	Suggested UCL to Use											
417			97.5% Chebyshev (Mean, Sd) UCL	5.774								
418												
419												
420												
421												
422												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
423												
424												
425												
426												
427												
428												
429												
430												
431												
432												
433												
434												
435												
436												
437												
438												
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South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
Selenium												
General Statistics												
487	Total Number of Observations		32				Number of Distinct Observations		31			
488							Number of Missing Observations		1			
489			Minimum	0.268					Mean	1.057		
490			Maximum	3.77					Median	0.813		
491			SD	0.752				Std. Error of Mean		0.133		
492			Coefficient of Variation	0.712					Skewness	1.851		
Normal GOF Test												
494	Shapiro Wilk Test Statistic		0.825				Shapiro Wilk GOF Test					
495	5% Shapiro Wilk Critical Value		0.93				Data Not Normal at 5% Significance Level					
496	Lilliefors Test Statistic		0.219				Lilliefors GOF Test					
497	5% Lilliefors Critical Value		0.154				Data Not Normal at 5% Significance Level					
498	Data Not Normal at 5% Significance Level											
499	Assuming Normal Distribution											
500	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
501	95% Student's-t UCL		1.282				95% Adjusted-CLT UCL (Chen-1995)		1.322			
502							95% Modified-t UCL (Johnson-1978)		1.289			
503	Gamma GOF Test											
504	A-D Test Statistic		0.545				Anderson-Darling Gamma GOF Test					
505	5% A-D Critical Value		0.755				Detected data appear Gamma Distributed at 5% Significance Level					
506	K-S Test Statistic		0.141				Kolmogorov-Smirnov Gamma GOF Test					
507	5% K-S Critical Value		0.157				Detected data appear Gamma Distributed at 5% Significance Level					
508	Detected data appear Gamma Distributed at 5% Significance Level											
509	Gamma Statistics											
510	k hat (MLE)		2.631				k star (bias corrected MLE)		2.405			
511	Theta hat (MLE)		0.402				Theta star (bias corrected MLE)		0.439			
512	nu hat (MLE)		168.4				nu star (bias corrected)		153.9			
513	MLE Mean (bias corrected)		1.057				MLE Sd (bias corrected)		0.681			
514							Approximate Chi Square Value (0.05)		126.2			
515	Adjusted Level of Significance		0.0416				Adjusted Chi Square Value		124.9			
516	Assuming Gamma Distribution											
517	95% Approximate Gamma UCL (use when n>=50)		1.288				95% Adjusted Gamma UCL (use when n<50)		1.302			
518	Lognormal GOF Test											
519	Shapiro Wilk Test Statistic		0.979				Shapiro Wilk Lognormal GOF Test					
520	5% Shapiro Wilk Critical Value		0.93				Data appear Lognormal at 5% Significance Level					
521	Lilliefors Test Statistic		0.0969				Lilliefors Lognormal GOF Test					
522	5% Lilliefors Critical Value		0.154				Data appear Lognormal at 5% Significance Level					
523	Data appear Lognormal at 5% Significance Level											
524	Lognormal Statistics											
525	Minimum of Logged Data		-1.317				Mean of logged Data		-0.147			
526	Maximum of Logged Data		1.327				SD of logged Data		0.633			
527	Assuming Lognormal Distribution											
528	95% H-UCL		1.33				90% Chebyshev (MVUE) UCL		1.423			
529	95% Chebyshev (MVUE) UCL		1.593				97.5% Chebyshev (MVUE) UCL		1.829			
530	99% Chebyshev (MVUE) UCL		2.293									
531	Nonparametric Distribution Free UCL Statistics											
532	Data appear to follow a Discernible Distribution at 5% Significance Level											
533	Nonparametric Distribution Free UCLs											
534	95% CLT UCL		1.275				95% Jackknife UCL		1.282			
535	95% Standard Bootstrap UCL		1.267				95% Bootstrap-t UCL		1.332			
536	95% Hall's Bootstrap UCL		1.401				95% Percentile Bootstrap UCL		1.27			
537	95% BCA Bootstrap UCL		1.334									
538	90% Chebyshev(Mean, Sd) UCL		1.455				95% Chebyshev(Mean, Sd) UCL		1.636			
539	97.5% Chebyshev(Mean, Sd) UCL		1.887				99% Chebyshev(Mean, Sd) UCL		2.379			
540	Suggested UCL to Use											
541	95% Adjusted Gamma UCL		1.302									
542												

**South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L	
543					UCL Statistics for Data Sets with Non-Detects								
544		User Selected Options		South Pit 1-2 feet bgs NDs									
545		Date/Time of Computation		ProUCL 5.112/15/2017 6:15:14 PM									
546		From File		171215 Summary Tables Soil Statistics_a.xls									
547		Full Precision		OFF									
548		Confidence Coefficient		95%									
549		Number of Bootstrap Operations		2000									
550													

**South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
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**South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L						
4,4'-DDT																		
General Statistics																		
645	Total Number of Observations	32					Number of Distinct Observations	22										
646							Number of Missing Observations	1										
647	Number of Detects	8					Number of Non-Detects	24										
648	Number of Distinct Detects	8					Number of Distinct Non-Detects	14										
649	Minimum Detect	0.011					Minimum Non-Detect	5.6000E-4										
650	Maximum Detect	0.088					Maximum Non-Detect	0.064										
651	Variance Detects	6.1827E-4					Percent Non-Detects	75%										
652	Mean Detects	0.0444					SD Detects	0.0249										
653	Median Detects	0.048					CV Detects	0.56										
654	Skewness Detects	0.355					Kurtosis Detects	-0.0359										
655	Mean of Logged Detects	-3.29					SD of Logged Detects	0.685										
656	Normal GOF Test on Detects Only																	
657	Shapiro Wilk Test Statistic	0.956					Shapiro Wilk GOF Test											
658	5% Shapiro Wilk Critical Value	0.818					Detected Data appear Normal at 5% Significance Level											
659	Lilliefors Test Statistic	0.167					Lilliefors GOF Test											
660	5% Lilliefors Critical Value	0.283					Detected Data appear Normal at 5% Significance Level											
661	Detected Data appear Normal at 5% Significance Level																	
662	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																	
663	KM Mean	0.0118					KM Standard Error of Mean	0.00428										
664	KM SD	0.0224					95% KM (BCA) UCL	0.0194										
665	95% KM (t) UCL	0.019					95% KM (Percentile Bootstrap) UCL	0.0183										
666	95% KM (z) UCL	0.0188					95% KM Bootstrap t UCL	0.0202										
667	90% KM Chebyshev UCL	0.0246					95% KM Chebyshev UCL	0.0304										
668	97.5% KM Chebyshev UCL	0.0385					99% KM Chebyshev UCL	0.0543										
669	Gamma GOF Tests on Detected Observations Only																	
670	A-D Test Statistic	0.297					Anderson-Darling GOF Test											
671	5% A-D Critical Value	0.721					Detected data appear Gamma Distributed at 5% Significance Level											
672	K-S Test Statistic	0.211					Kolmogorov-Smirnov GOF											
673	5% K-S Critical Value	0.296					Detected data appear Gamma Distributed at 5% Significance Level											
674	Detected data appear Gamma Distributed at 5% Significance Level																	
675	Gamma Statistics on Detected Data Only																	
676	k hat (MLE)	3.01					k star (bias corrected MLE)	1.965										
677	Theta hat (MLE)	0.0147					Theta star (bias corrected MLE)	0.0226										
678	nu hat (MLE)	48.16					nu star (bias corrected)	31.44										
679	Mean (detects)	0.0444																
680	Gamma ROS Statistics using Imputed Non-Detects																	
681	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																	
682	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																	
683	For such situations, GROS method may yield incorrect values of UCLs and BTVs																	
684	This is especially true when the sample size is small.																	
685	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																	
686	Minimum	0.01					Mean	0.0186										
687	Maximum	0.088					Median	0.01										
688	SD	0.0192					CV	1.032										
689	k hat (MLE)	1.865					k star (bias corrected MLE)	1.711										
690	Theta hat (MLE)	0.00997					Theta star (bias corrected MLE)	0.0109										
691	nu hat (MLE)	119.3					nu star (bias corrected)	109.5										
692	Adjusted Level of Significance (β)	0.0416																
693	Approximate Chi Square Value (109.48, α)	86.33					Adjusted Chi Square Value (109.48, β)	85.23										
694	95% Gamma Approximate UCL (use when n>=50)	0.0236					95% Gamma Adjusted UCL (use when n<50)	0.0239										
695	Estimates of Gamma Parameters using KM Estimates																	
696	Mean (KM)	0.0118					SD (KM)	0.0224										
697	Variance (KM)	5.0166E-4					SE of Mean (KM)	0.00428										
698	k hat (KM)	0.277					k star (KM)	0.272										
699	nu hat (KM)	17.73					nu star (KM)	17.4										
700	theta hat (KM)	0.0426					theta star (KM)	0.0434										
701	80% gamma percentile (KM)	0.0176					90% gamma percentile (KM)	0.0351										
702	95% gamma percentile (KM)	0.0556					99% gamma percentile (KM)	0.11										
703	Gamma Kaplan-Meier (KM) Statistics																	
704	Approximate Chi Square Value (17.40, α)	8.957					Adjusted Chi Square Value (17.40, β)	8.633										

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
705	95% Gamma Approximate KM-UCL (use when n>=50)		0.0229		95% Gamma Adjusted KM-UCL (use when n<50)			0.0238				
Lognormal GOF Test on Detected Observations Only												
707	Shapiro Wilk Test Statistic		0.929		Shapiro Wilk GOF Test							
708	5% Shapiro Wilk Critical Value		0.818		Detected Data appear Lognormal at 5% Significance Level							
709	Lilliefors Test Statistic		0.234		Lilliefors GOF Test							
710	5% Lilliefors Critical Value		0.283		Detected Data appear Lognormal at 5% Significance Level							
711	Detected Data appear Lognormal at 5% Significance Level											
712	Lognormal ROS Statistics Using Imputed Non-Detects											
713	Mean in Original Scale		0.0152		Mean in Log Scale		-4.798					
714	SD in Original Scale		0.0209		SD in Log Scale		1.017					
715	95% t UCL (assumes normality of ROS data)		0.0214		95% Percentile Bootstrap UCL		0.0215					
716	95% BCA Bootstrap UCL		0.0227		95% Bootstrap t UCL		0.0242					
717	95% H-UCL (Log ROS)		0.0216									
718	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
719	KM Mean (logged)		-6.409		KM Geo Mean		0.00165					
720	KM SD (logged)		1.862		95% Critical H Value (KM-Log)		3.62					
721	KM Standard Error of Mean (logged)		0.357		95% H-UCL (KM -Log)		0.0313					
722	KM SD (logged)		1.862		95% Critical H Value (KM-Log)		3.62					
723	KM Standard Error of Mean (logged)		0.357									
724	DL/2 Statistics											
725	DL/2 Normal				DL/2 Log-Transformed							
726	Mean in Original Scale		0.0132		Mean in Log Scale		-5.827					
727	SD in Original Scale		0.0224		SD in Log Scale		1.829					
728	95% t UCL (Assumes normality)		0.02		95% H-Stat UCL		0.0508					
729	DL/2 is not a recommended method, provided for comparisons and historical reasons											
730	Nonparametric Distribution Free UCL Statistics											
731	Detected Data appear Normal Distributed at 5% Significance Level											
732	Suggested UCL to Use											
733	95% KM (t) UCL		0.019									
802												

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L				
High Molecular Weight PAHs																
General Statistics																
803																
804																
805	Total Number of Observations			32					Number of Distinct Observations		31					
806									Number of Missing Observations		1					
807				Number of Detects	29				Number of Non-Detects		3					
808				Number of Distinct Detects	29				Number of Distinct Non-Detects		3					
809				Minimum Detect	0.0172				Minimum Non-Detect		0.00565					
810				Maximum Detect	29.5				Maximum Non-Detect		0.0172					
811				Variance Detects	29.59				Percent Non-Detects		9.375%					
812				Mean Detects	1.93				SD Detects		5.439					
813				Median Detects	0.611				CV Detects		2.819					
814				Skewness Detects	4.984				Kurtosis Detects		25.88					
815				Mean of Logged Detects	-0.99				SD of Logged Detects		1.952					
816	Normal GOF Test on Detects Only															
817				Shapiro Wilk Test Statistic	0.348				Shapiro Wilk GOF Test							
818				5% Shapiro Wilk Critical Value	0.926				Detected Data Not Normal at 5% Significance Level							
819				Lilliefors Test Statistic	0.376				Lilliefors GOF Test							
820				5% Lilliefors Critical Value	0.161				Detected Data Not Normal at 5% Significance Level							
821	Detected Data Not Normal at 5% Significance Level															
822	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs															
823				KM Mean	1.749				KM Standard Error of Mean		0.921					
824				KM SD	5.119				95% KM (BCA) UCL		3.657					
825				95% KM (t) UCL	3.311				95% KM (Percentile Bootstrap) UCL		3.488					
826				95% KM (z) UCL	3.264				95% KM Bootstrap t UCL		8.537					
827				90% KM Chebyshev UCL	4.512				95% KM Chebyshev UCL		5.763					
828				97.5% KM Chebyshev UCL	7.5				99% KM Chebyshev UCL		10.91					
829	Gamma GOF Tests on Detected Observations Only															
830				A-D Test Statistic	1.071				Anderson-Darling GOF Test							
831				5% A-D Critical Value	0.834				Detected Data Not Gamma Distributed at 5% Significance Level							
832				K-S Test Statistic	0.167				Kolmogorov-Smirnov GOF							
833				5% K-S Critical Value	0.174				Detected data appear Gamma Distributed at 5% Significance Level							
834	Detected data follow Appr. Gamma Distribution at 5% Significance Level															
835	Gamma Statistics on Detected Data Only															
836				k hat (MLE)	0.399				k star (bias corrected MLE)		0.381					
837				Theta hat (MLE)	4.83				Theta star (bias corrected MLE)		5.063					
838				nu hat (MLE)	23.17				nu star (bias corrected)		22.11					
839				Mean (detects)	1.93											
840	Gamma ROS Statistics using Imputed Non-Detects															
841				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
842				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)												
843				For such situations, GROS method may yield incorrect values of UCLs and BTVs												
844				This is especially true when the sample size is small.												
845				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
846				Minimum	0.01				Mean		1.75					
847				Maximum	29.5				Median		0.381					
848				SD	5.201				CV		2.972					
849				k hat (MLE)	0.355				k star (bias corrected MLE)		0.343					
850				Theta hat (MLE)	4.926				Theta star (bias corrected MLE)		5.105					
851				nu hat (MLE)	22.73				nu star (bias corrected)		21.93					
852				Adjusted Level of Significance (β)	0.0416											
853				Approximate Chi Square Value (21.93, α)	12.29				Adjusted Chi Square Value (21.93, β)		11.9					
854				95% Gamma Approximate UCL (use when n>=50)	3.123				95% Gamma Adjusted UCL (use when n<50)		3.224					
855	Estimates of Gamma Parameters using KM Estimates															
856				Mean (KM)	1.749				SD (KM)		5.119					
857				Variance (KM)	26.2				SE of Mean (KM)		0.921					
858				k hat (KM)	0.117				k star (KM)		0.127					
859				nu hat (KM)	7.473				nu star (KM)		8.106					
860				theta hat (KM)	14.98				theta star (KM)		13.81					
861				80% gamma percentile (KM)	1.627				90% gamma percentile (KM)		5.025					
862				95% gamma percentile (KM)	9.909				99% gamma percentile (KM)		24.62					
863	Gamma Kaplan-Meier (KM) Statistics															
864				Approximate Chi Square Value (8.11, α)	2.796				Adjusted Chi Square Value (8.11, β)		2.632					

South Pit Soil 1-2 feet bgs
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
865		95% Gamma Approximate KM-UCL (use when n>=50)		5.07		95% Gamma Adjusted KM-UCL (use when n<50)		5.388				
Lognormal GOF Test on Detected Observations Only												
867		Shapiro Wilk Test Statistic		0.95		Shapiro Wilk GOF Test						
868		5% Shapiro Wilk Critical Value		0.926		Detected Data appear Lognormal at 5% Significance Level						
869		Lilliefors Test Statistic		0.118		Lilliefors GOF Test						
870		5% Lilliefors Critical Value		0.161		Detected Data appear Lognormal at 5% Significance Level						
871	Detected Data appear Lognormal at 5% Significance Level											
872	Lognormal ROS Statistics Using Imputed Non-Detects											
873		Mean in Original Scale		1.749		Mean in Log Scale		-1.406				
874		SD in Original Scale		5.201		SD in Log Scale		2.273				
875		95% t UCL (assumes normality of ROS data)		3.308		95% Percentile Bootstrap UCL		3.473				
876		95% BCA Bootstrap UCL		4.459		95% Bootstrap t UCL		8.732				
877		95% H-UCL (Log ROS)		18.45								
878	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
879		KM Mean (logged)		-1.383		KM Geo Mean		0.251				
880		KM SD (logged)		2.196		95% Critical H Value (KM-Log)		4.134				
881		KM Standard Error of Mean (logged)		0.395		95% H-UCL (KM -Log)		14.3				
882		KM SD (logged)		2.196		95% Critical H Value (KM-Log)		4.134				
883		KM Standard Error of Mean (logged)		0.395								
884	DL/2 Statistics											
885	DL/2 Normal					DL/2 Log-Transformed						
886		Mean in Original Scale		1.749		Mean in Log Scale		-1.38				
887		SD in Original Scale		5.201		SD in Log Scale		2.233				
888		95% t UCL (Assumes normality)		3.308		95% H-Stat UCL		16.35				
889	DL/2 is not a recommended method, provided for comparisons and historical reasons											
890	Nonparametric Distribution Free UCL Statistics											
891	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
892	Suggested UCL to Use											
893					5.388	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but !)						
894	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
895	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											

East Ditch South Segment - Sediment as Soil
Summary of 95% Upper Confidence Limits (UCLs) (mg/kg)
Brine Service Company Superfund Site

COPC	2018	95% UCL	Comment
Barium	1347	95% Adjusted Gamma UCL	
Cadmium	1.477	95% Chebyshev (Mean, Sd) UCL	
Copper	12.47	95% Student's t UCL	
Lead	39.88	95% Student's t UCL	
Selenium	0.512	95% KM (t) UCL	
Vanadium	15	95% Student's t UCL	
Zinc	242.9	95% Chebyshev (Mean, Sd) UCL	
Mercury	0.124	95% Chebyshev (Mean, Sd) UCL	

**Data Set for Representative Concentrations in the East Ditch South
Brine Service Company Superfund Site**

Sample Location	Depth Interval	Barium	Cadmium	Copper	Lead	Selenium	D_Selenium	Vanadium	Zinc	Mercury
EDSSD01	0-0.5 ft	9.78E+02	3.52E-01	1.19E+01	3.30E+01	7.57E-01	1	1.77E+01	6.01E+01	2.46E-02
EDSSD01	0-0.5 ft	5.94E+02	2.66E-01	9.11E+00	2.28E+01	5.12E-01	1	1.31E+01	4.56E+01	2.13E-02
EDSSD02	0-0.5 ft	5.67E+02	1.92E-01	5.25E+00	1.41E+01	3.71E-01	1	1.57E+01	2.24E+01	7.35E-03
EDSSD03	0-0.5 ft	4.84E+02	3.55E-01	5.26E+00	1.26E+01	3.99E-01	1	9.79E+00	4.80E+01	2.19E-02
EDSSD04	0-0.5 ft	1.25E+03	3.33E-01	7.49E+00	1.80E+01	5.01E-01	1	1.34E+01	4.83E+01	2.25E-02
EDSSD05	0-0.5 ft	2.64E+02	9.66E-02	3.28E+00	6.41E+00	3.20E-01	0	1.02E+01	1.56E+01	5.60E-03
EDSSD06	0-0.5 ft	3.95E+02	3.12E-01	7.80E+00	1.12E+01	5.90E-01	1	1.43E+01	3.39E+01	1.43E-02
EDSSD07	0-0.5 ft	5.86E+02	3.27E-01	6.37E+00	1.40E+01	5.71E-01	1	1.38E+01	3.28E+01	1.28E-02
EDSSD08	0-0.5 ft	6.74E+02	3.94E-01	1.25E+01	7.70E+01	6.41E-01	1	1.42E+01	7.89E+01	1.84E-02
EDSSD03A	0-6 in	1.46E+03	2.11E-01	7.18E+00	2.04E+01	2.90E-01	1	1.24E+01	3.52E+01	1.34E-01
EDSSD03B	0-6 in	1.84E+03	3.74E-01	1.05E+01	3.54E+01	2.34E-01	0	1.28E+01	5.56E+01	2.30E-02
EDSSD03C	0-6 in	2.69E+03	6.26E-01	2.15E+01	7.63E+01	3.24E-01	1	1.98E+01	1.24E+02	5.70E-02
EDSSD03D	0-6 in	6.46E+02	3.32E+00	2.06E+01	4.21E+01	3.50E-01	1	1.43E+01	5.45E+02	2.50E-01
EDSSD03E	0-6 in	3.83E+02	2.80E-01	1.01E+01	2.62E+01	2.89E-01	1	9.51E+00	5.59E+01	2.72E-02
Max		2.69E+03	3.32E+00	2.15E+01	7.70E+01	7.57E-01		1.98E+01	5.45E+02	2.50E-01
Min		2.64E+02	9.66E-02	3.28E+00	6.41E+00	2.34E-01		9.51E+00	1.56E+01	5.60E-03
Average		9.15E+02	5.31E-01	9.92E+00	2.93E+01	4.39E-01		1.36E+01	8.58E+01	4.57E-02
Count		14	14	14	14	14		14	14	14

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	Date/Time of Computation											
3	From File											
4	Full Precision											
5	Confidence Coefficient											
6	Number of Bootstrap Operations											
7												

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L							
8	Barium																		
9	General Statistics																		
10	Total Number of Observations			14	Number of Distinct Observations			14											
11					Number of Missing Observations			0											
12	Minimum			264					Mean 915.1										
13	Maximum			2690					Median 620										
14	SD			681.9					Std. Error of Mean 182.3										
15	Coefficient of Variation			0.745					Skewness 1.639										
16	Normal GOF Test																		
17	Shapiro Wilk Test Statistic			0.812	Shapiro Wilk GOF Test														
18	5% Shapiro Wilk Critical Value			0.874	Data Not Normal at 5% Significance Level														
19	Lilliefors Test Statistic			0.281	Lilliefors GOF Test														
20	5% Lilliefors Critical Value			0.226	Data Not Normal at 5% Significance Level														
21	Data Not Normal at 5% Significance Level																		
22	Assuming Normal Distribution																		
23	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
24	95% Student's-t UCL				95% Adjusted-CLT UCL (Chen-1995) 1300														
25					95% Modified-t UCL (Johnson-1978) 1251														
26	Gamma GOF Test																		
27	A-D Test Statistic			0.534	Anderson-Darling Gamma GOF Test														
28	5% A-D Critical Value			0.744	Detected data appear Gamma Distributed at 5% Significance Level														
29	K-S Test Statistic			0.239	Kolmogorov-Smirnov Gamma GOF Test														
30	5% K-S Critical Value			0.231	Data Not Gamma Distributed at 5% Significance Level														
31	Detected data follow Appr. Gamma Distribution at 5% Significance Level																		
32	Gamma Statistics																		
33	k hat (MLE)			2.504	k star (bias corrected MLE)			2.015											
34	Theta hat (MLE)			365.5	Theta star (bias corrected MLE)			454.2											
35	nu hat (MLE)			70.11	nu star (bias corrected)			56.42											
36	MLE Mean (bias corrected)			915.1	MLE Sd (bias corrected)			644.7											
37					Approximate Chi Square Value (0.05)			40.15											
38	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			38.34											
39	Assuming Gamma Distribution																		
40	95% Approximate Gamma UCL (use when n>=50)			1286	95% Adjusted Gamma UCL (use when n<50)			1347											
41	Lognormal GOF Test																		
42	Shapiro Wilk Test Statistic			0.958	Shapiro Wilk Lognormal GOF Test														
43	5% Shapiro Wilk Critical Value			0.874	Data appear Lognormal at 5% Significance Level														
44	Lilliefors Test Statistic			0.199	Lilliefors Lognormal GOF Test														
45	5% Lilliefors Critical Value			0.226	Data appear Lognormal at 5% Significance Level														
46	Data appear Lognormal at 5% Significance Level																		
47	Lognormal Statistics																		
48	Minimum of Logged Data			5.576	Mean of logged Data			6.606											
49	Maximum of Logged Data			7.897	SD of logged Data			0.655											
50	Assuming Lognormal Distribution																		
51	95% H-UCL			1389	90% Chebyshev (MVUE) UCL			1395											
52	95% Chebyshev (MVUE) UCL			1619	97.5% Chebyshev (MVUE) UCL			1930											
53	99% Chebyshev (MVUE) UCL			2540															
54	Nonparametric Distribution Free UCL Statistics																		
55	Data appear to follow a Discernible Distribution at 5% Significance Level																		
56	Nonparametric Distribution Free UCLs																		
57	95% CLT UCL			1215	95% Jackknife UCL			1238											
58	95% Standard Bootstrap UCL			1218	95% Bootstrap-t UCL			1411											
59	95% Hall's Bootstrap UCL			1454	95% Percentile Bootstrap UCL			1227											
60	95% BCA Bootstrap UCL			1296															
61	90% Chebyshev(Mean, Sd) UCL			1462	95% Chebyshev(Mean, Sd) UCL			1709											
62	97.5% Chebyshev(Mean, Sd) UCL			2053	99% Chebyshev(Mean, Sd) UCL			2728											
63	Suggested UCL to Use																		
64	95% Adjusted Gamma UCL			1347															
65	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																		
66	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																		
67																			

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L						
68	Cadmium																	
69	General Statistics																	
70	Total Number of Observations			14	Number of Distinct Observations			14										
71					Number of Missing Observations			0										
72	Minimum			0.0966	Mean			0.531										
73	Maximum			3.32	Median			0.33										
74	SD			0.812	Std. Error of Mean			0.217										
75	Coefficient of Variation			1.527	Skewness			3.602										
76	Normal GOF Test																	
77	Shapiro Wilk Test Statistic			0.428	Shapiro Wilk GOF Test													
78	5% Shapiro Wilk Critical Value			0.874	Data Not Normal at 5% Significance Level													
79	Lilliefors Test Statistic			0.424	Lilliefors GOF Test													
80	5% Lilliefors Critical Value			0.226	Data Not Normal at 5% Significance Level													
81	Data Not Normal at 5% Significance Level																	
82	Assuming Normal Distribution																	
83	95% Normal UCL				95% UCLs (Adjusted for Skewness)													
84	95% Student's-t UCL				0.915	95% Adjusted-CLT UCL (Chen-1995)			1.111									
85						95% Modified-t UCL (Johnson-1978)			0.95									
86	Gamma GOF Test																	
87	A-D Test Statistic			2.011	Anderson-Darling Gamma GOF Test													
88	5% A-D Critical Value			0.754	Data Not Gamma Distributed at 5% Significance Level													
89	K-S Test Statistic			0.368	Kolmogorov-Smirnov Gamma GOF Test													
90	5% K-S Critical Value			0.234	Data Not Gamma Distributed at 5% Significance Level													
91	Data Not Gamma Distributed at 5% Significance Level																	
92	Gamma Statistics																	
93	k hat (MLE)			1.322	k star (bias corrected MLE)			1.086										
94	Theta hat (MLE)			0.402	Theta star (bias corrected MLE)			0.489										
95	nu hat (MLE)			37.01	nu star (bias corrected)			30.41										
96	MLE Mean (bias corrected)			0.531	MLE Sd (bias corrected)			0.51										
97					Approximate Chi Square Value (0.05)			18.82										
98	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			17.61										
99	Assuming Gamma Distribution																	
100	95% Approximate Gamma UCL (use when n>=50)			0.859	95% Adjusted Gamma UCL (use when n<50)			0.917										
101	Lognormal GOF Test																	
102	Shapiro Wilk Test Statistic			0.8	Shapiro Wilk Lognormal GOF Test													
103	5% Shapiro Wilk Critical Value			0.874	Data Not Lognormal at 5% Significance Level													
104	Lilliefors Test Statistic			0.293	Lilliefors Lognormal GOF Test													
105	5% Lilliefors Critical Value			0.226	Data Not Lognormal at 5% Significance Level													
106	Data Not Lognormal at 5% Significance Level																	
107	Lognormal Statistics																	
108	Minimum of Logged Data			-2.337	Mean of logged Data			-1.056										
109	Maximum of Logged Data			1.2	SD of logged Data			0.776										
110	Assuming Lognormal Distribution																	
111	95% H-UCL			0.796	90% Chebyshev (MVUE) UCL			0.76										
112	95% Chebyshev (MVUE) UCL			0.897	97.5% Chebyshev (MVUE) UCL			1.086										
113	99% Chebyshev (MVUE) UCL			1.459														
114	Nonparametric Distribution Free UCL Statistics																	
115	Data do not follow a Discernible Distribution (0.05)																	
116	Nonparametric Distribution Free UCLs																	
117	95% CLT UCL			0.888	95% Jackknife UCL			0.915										
118	95% Standard Bootstrap UCL			0.886	95% Bootstrap-t UCL			2.911										
119	95% Hall's Bootstrap UCL			3.149	95% Percentile Bootstrap UCL			0.936										
120	95% BCA Bootstrap UCL			1.204														
121	90% Chebyshev(Mean, Sd) UCL			1.182	95% Chebyshev(Mean, Sd) UCL			1.477										
122	97.5% Chebyshev(Mean, Sd) UCL			1.886	99% Chebyshev(Mean, Sd) UCL			2.689										
123	Suggested UCL to Use																	
124	95% Chebyshev (Mean, Sd) UCL			1.477														
125																		

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L			
126	Copper														
127	General Statistics														
128	Total Number of Observations				14	Number of Distinct Observations									14
129						Number of Missing Observations									0
130	Minimum				3.28	Mean									9.917
131	Maximum				21.5	Median									8.455
132	SD				5.391	Std. Error of Mean									1.441
133	Coefficient of Variation				0.544	Skewness									1.268
134	Normal GOF Test														
135	Shapiro Wilk Test Statistic				0.864	Shapiro Wilk GOF Test									
136	5% Shapiro Wilk Critical Value				0.874	Data Not Normal at 5% Significance Level									
137	Lilliefors Test Statistic				0.173	Lilliefors GOF Test									
138	5% Lilliefors Critical Value				0.226	Data appear Normal at 5% Significance Level									
139	Data appear Approximate Normal at 5% Significance Level														
140	Assuming Normal Distribution														
141	95% Normal UCL					95% UCLs (Adjusted for Skewness)									
142	95% Student's-t UCL				12.47	95% Adjusted-CLT UCL (Chen-1995)									12.81
143						95% Modified-t UCL (Johnson-1978)									12.55
144	Gamma GOF Test														
145	A-D Test Statistic				0.311	Anderson-Darling Gamma GOF Test									
146	5% A-D Critical Value				0.74	Detected data appear Gamma Distributed at 5% Significance Level									
147	K-S Test Statistic				0.119	Kolmogorov-Smirnov Gamma GOF Test									
148	5% K-S Critical Value				0.23	Detected data appear Gamma Distributed at 5% Significance Level									
149	Detected data appear Gamma Distributed at 5% Significance Level														
150	Gamma Statistics														
151	k hat (MLE)				4.15	k star (bias corrected MLE)									3.308
152	Theta hat (MLE)				2.39	Theta star (bias corrected MLE)									2.997
153	nu hat (MLE)				116.2	nu star (bias corrected)									92.64
154	MLE Mean (bias corrected)				9.917	MLE Sd (bias corrected)									5.452
155						Approximate Chi Square Value (0.05)									71.44
156	Adjusted Level of Significance				0.0312	Adjusted Chi Square Value									68.98
157	Assuming Gamma Distribution														
158	95% Approximate Gamma UCL (use when n>=50)				12.86	95% Adjusted Gamma UCL (use when n<50)									13.32
159	Lognormal GOF Test														
160	Shapiro Wilk Test Statistic				0.972	Shapiro Wilk Lognormal GOF Test									
161	5% Shapiro Wilk Critical Value				0.874	Data appear Lognormal at 5% Significance Level									
162	Lilliefors Test Statistic				0.102	Lilliefors Lognormal GOF Test									
163	5% Lilliefors Critical Value				0.226	Data appear Lognormal at 5% Significance Level									
164	Data appear Lognormal at 5% Significance Level														
165	Lognormal Statistics														
166	Minimum of Logged Data				1.188	Mean of logged Data									2.169
167	Maximum of Logged Data				3.068	SD of logged Data									0.517
168	Assuming Lognormal Distribution														
169	95% H-UCL				13.38	90% Chebyshev (MVUE) UCL									14.12
170	95% Chebyshev (MVUE) UCL				16.04	97.5% Chebyshev (MVUE) UCL									18.7
171	99% Chebyshev (MVUE) UCL				23.92										
172	Nonparametric Distribution Free UCL Statistics														
173	Data appear to follow a Discernible Distribution at 5% Significance Level														
174	Nonparametric Distribution Free UCLs														
175	95% CLT UCL				12.29	95% Jackknife UCL									12.47
176	95% Standard Bootstrap UCL				12.25	95% Bootstrap-t UCL									13.83
177	95% Hall's Bootstrap UCL				18.5	95% Percentile Bootstrap UCL									12.41
178	95% BCA Bootstrap UCL				12.77										
179	90% Chebyshev(Mean, Sd) UCL				14.24	95% Chebyshev(Mean, Sd) UCL									16.2
180	97.5% Chebyshev(Mean, Sd) UCL				18.92	99% Chebyshev(Mean, Sd) UCL									24.25
181	Suggested UCL to Use														
182	95% Student's-t UCL				12.47										
183	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test														
184	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL														
185															

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L									
186	Lead																				
187	General Statistics																				
188	Total Number of Observations			14	Number of Distinct Observations			14													
189					Number of Missing Observations			0													
190	Minimum			6.41	Mean			29.25													
191	Maximum			77	Median			21.6													
192	SD			22.45	Std. Error of Mean			6.001													
193	Coefficient of Variation			0.768	Skewness			1.456													
194	Normal GOF Test																				
195	Shapiro Wilk Test Statistic			0.808	Shapiro Wilk GOF Test																
196	5% Shapiro Wilk Critical Value			0.874	Data Not Normal at 5% Significance Level																
197	Lilliefors Test Statistic			0.197	Lilliefors GOF Test																
198	5% Lilliefors Critical Value			0.226	Data appear Normal at 5% Significance Level																
199	Data appear Approximate Normal at 5% Significance Level																				
200	Assuming Normal Distribution																				
201	95% Normal UCL				95% UCLs (Adjusted for Skewness)																
202	95% Student's-t UCL				39.88	95% Adjusted-CLT UCL (Chen-1995)				41.62											
203						95% Modified-t UCL (Johnson-1978)				40.27											
204	Gamma GOF Test																				
205	A-D Test Statistic			0.391	Anderson-Darling Gamma GOF Test																
206	5% A-D Critical Value			0.745	Detected data appear Gamma Distributed at 5% Significance Level																
207	K-S Test Statistic			0.125	Kolmogorov-Smirnov Gamma GOF Test																
208	5% K-S Critical Value			0.231	Detected data appear Gamma Distributed at 5% Significance Level																
209	Detected data appear Gamma Distributed at 5% Significance Level																				
210	Gamma Statistics																				
211	k hat (MLE)			2.217	k star (bias corrected MLE)			1.79													
212	Theta hat (MLE)			13.19	Theta star (bias corrected MLE)			16.34													
213	nu hat (MLE)			62.09	nu star (bias corrected)			50.11													
214	MLE Mean (bias corrected)			29.25	MLE Sd (bias corrected)			21.86													
215					Approximate Chi Square Value (0.05)			34.86													
216	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			33.18													
217	Assuming Gamma Distribution																				
218	95% Approximate Gamma UCL (use when n>=50)			42.05	95% Adjusted Gamma UCL (use when n<50)			44.18													
219	Lognormal GOF Test																				
220	Shapiro Wilk Test Statistic			0.968	Shapiro Wilk Lognormal GOF Test																
221	5% Shapiro Wilk Critical Value			0.874	Data appear Lognormal at 5% Significance Level																
222	Lilliefors Test Statistic			0.109	Lilliefors Lognormal GOF Test																
223	5% Lilliefors Critical Value			0.226	Data appear Lognormal at 5% Significance Level																
224	Data appear Lognormal at 5% Significance Level																				
225	Lognormal Statistics																				
226	Minimum of Logged Data			1.858	Mean of logged Data			3.134													
227	Maximum of Logged Data			4.344	SD of logged Data			0.716													
228	Assuming Lognormal Distribution																				
229	95% H-UCL			47.41	90% Chebyshev (MVUE) UCL			46.57													
230	95% Chebyshev (MVUE) UCL			54.52	97.5% Chebyshev (MVUE) UCL			65.55													
231	99% Chebyshev (MVUE) UCL			87.21																	
232	Nonparametric Distribution Free UCL Statistics																				
233	Data appear to follow a Discernible Distribution at 5% Significance Level																				
234	Nonparametric Distribution Free UCLs																				
235	95% CLT UCL			39.12	95% Jackknife UCL			39.88													
236	95% Standard Bootstrap UCL			38.79	95% Bootstrap-t UCL			46.61													
237	95% Hall's Bootstrap UCL			58.06	95% Percentile Bootstrap UCL			39.75													
238	95% BCA Bootstrap UCL			40.94																	
239	90% Chebyshev(Mean, Sd) UCL			47.25	95% Chebyshev(Mean, Sd) UCL			55.41													
240	97.5% Chebyshev(Mean, Sd) UCL			66.72	99% Chebyshev(Mean, Sd) UCL			88.96													
241	Suggested UCL to Use																				
242	95% Student's-t UCL			39.88																	
243	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test																				
244	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL																				
245																					

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L									
246	Vanadium																				
247	General Statistics																				
248	Total Number of Observations			14	Number of Distinct Observations			13													
249					Number of Missing Observations			0													
250	Minimum			9.51	Mean			13.64													
251	Maximum			19.8	Median			13.6													
252	SD			2.858	Std. Error of Mean			0.764													
253	Coefficient of Variation			0.209	Skewness			0.532													
254	Normal GOF Test																				
255	Shapiro Wilk Test Statistic			0.941	Shapiro Wilk GOF Test																
256	5% Shapiro Wilk Critical Value			0.874	Data appear Normal at 5% Significance Level																
257	Lilliefors Test Statistic			0.195	Lilliefors GOF Test																
258	5% Lilliefors Critical Value			0.226	Data appear Normal at 5% Significance Level																
259	Data appear Normal at 5% Significance Level																				
260	Assuming Normal Distribution																				
261	95% Normal UCL				95% UCLs (Adjusted for Skewness)																
262	95% Student's-t UCL				15	95% Adjusted-CLT UCL (Chen-1995)				15.02											
263						95% Modified-t UCL (Johnson-1978)				15.01											
264	Gamma GOF Test																				
265	A-D Test Statistic			0.362	Anderson-Darling Gamma GOF Test																
266	5% A-D Critical Value			0.734	Detected data appear Gamma Distributed at 5% Significance Level																
267	K-S Test Statistic			0.167	Kolmogorov-Smirnov Gamma GOF Test																
268	5% K-S Critical Value			0.228	Detected data appear Gamma Distributed at 5% Significance Level																
269	Detected data appear Gamma Distributed at 5% Significance Level																				
270	Gamma Statistics																				
271	k hat (MLE)			24.94	k star (bias corrected MLE)			19.64													
272	Theta hat (MLE)			0.547	Theta star (bias corrected MLE)			0.695													
273	nu hat (MLE)			698.2	nu star (bias corrected)			549.9													
274	MLE Mean (bias corrected)			13.64	MLE Sd (bias corrected)			3.078													
275					Approximate Chi Square Value (0.05)			496.6													
276	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			489.8													
277	Assuming Gamma Distribution																				
278	95% Approximate Gamma UCL (use when n>=50)				15.11	95% Adjusted Gamma UCL (use when n<50)				15.32											
279	Lognormal GOF Test																				
280	Shapiro Wilk Test Statistic			0.95	Shapiro Wilk Lognormal GOF Test																
281	5% Shapiro Wilk Critical Value			0.874	Data appear Lognormal at 5% Significance Level																
282	Lilliefors Test Statistic			0.159	Lilliefors Lognormal GOF Test																
283	5% Lilliefors Critical Value			0.226	Data appear Lognormal at 5% Significance Level																
284	Data appear Lognormal at 5% Significance Level																				
285	Lognormal Statistics																				
286	Minimum of Logged Data			2.252	Mean of logged Data			2.593													
287	Maximum of Logged Data			2.986	SD of logged Data			0.209													
288	Assuming Lognormal Distribution																				
289	95% H-UCL			15.19	90% Chebyshev (MVUE) UCL			15.94													
290	95% Chebyshev (MVUE) UCL			16.98	97.5% Chebyshev (MVUE) UCL			18.42													
291	99% Chebyshev (MVUE) UCL			21.26																	
292	Nonparametric Distribution Free UCL Statistics																				
293	Data appear to follow a Discernible Distribution at 5% Significance Level																				
294	Nonparametric Distribution Free UCLs																				
295	95% CLT UCL			14.9	95% Jackknife UCL			15													
296	95% Standard Bootstrap UCL			14.86	95% Bootstrap-t UCL			15.2													
297	95% Hall's Bootstrap UCL			15.34	95% Percentile Bootstrap UCL			14.94													
298	95% BCA Bootstrap UCL			14.95																	
299	90% Chebyshev(Mean, Sd) UCL			15.93	95% Chebyshev(Mean, Sd) UCL			16.97													
300	97.5% Chebyshev(Mean, Sd) UCL			18.41	99% Chebyshev(Mean, Sd) UCL			21.24													
301	Suggested UCL to Use																				
302	95% Student's-t UCL				15																
303																					

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L							
304	Zinc																		
305	General Statistics																		
306	Total Number of Observations			14	Number of Distinct Observations			14											
307					Number of Missing Observations			0											
308	Minimum			15.6					Mean										
309	Maximum			545					Median										
310	SD			134.8					Std. Error of Mean										
311	Coefficient of Variation			1.571					Skewness										
312	Normal GOF Test																		
313	Shapiro Wilk Test Statistic			0.464	Shapiro Wilk GOF Test														
314	5% Shapiro Wilk Critical Value			0.874	Data Not Normal at 5% Significance Level														
315	Lilliefors Test Statistic			0.378	Lilliefors GOF Test														
316	5% Lilliefors Critical Value			0.226	Data Not Normal at 5% Significance Level														
317	Data Not Normal at 5% Significance Level																		
318	Assuming Normal Distribution																		
319	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
320	95% Student's-t UCL			149.6	95% Adjusted-CLT UCL (Chen-1995)			181.1											
321					95% Modified-t UCL (Johnson-1978)			155.2											
322	Gamma GOF Test																		
323	A-D Test Statistic			1.541	Anderson-Darling Gamma GOF Test														
324	5% A-D Critical Value			0.757	Data Not Gamma Distributed at 5% Significance Level														
325	K-S Test Statistic			0.305	Kolmogorov-Smirnov Gamma GOF Test														
326	5% K-S Critical Value			0.234	Data Not Gamma Distributed at 5% Significance Level														
327	Data Not Gamma Distributed at 5% Significance Level																		
328	Gamma Statistics																		
329	k hat (MLE)			1.183	k star (bias corrected MLE)			0.977											
330	Theta hat (MLE)			72.52	Theta star (bias corrected MLE)			87.8											
331	nu hat (MLE)			33.13	nu star (bias corrected)			27.36											
332	MLE Mean (bias corrected)			85.81	MLE Sd (bias corrected)			86.8											
333					Approximate Chi Square Value (0.05)			16.43											
334	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			15.32											
335	Assuming Gamma Distribution																		
336	95% Approximate Gamma UCL (use when n>=50)			142.9	95% Adjusted Gamma UCL (use when n<50)			153.3											
337	Lognormal GOF Test																		
338	Shapiro Wilk Test Statistic			0.866	Shapiro Wilk Lognormal GOF Test														
339	5% Shapiro Wilk Critical Value			0.874	Data Not Lognormal at 5% Significance Level														
340	Lilliefors Test Statistic			0.228	Lilliefors Lognormal GOF Test														
341	5% Lilliefors Critical Value			0.226	Data Not Lognormal at 5% Significance Level														
342	Data Not Lognormal at 5% Significance Level																		
343	Lognormal Statistics																		
344	Minimum of Logged Data			2.747	Mean of logged Data			3.973											
345	Maximum of Logged Data			6.301	SD of logged Data			0.842											
346	Assuming Lognormal Distribution																		
347	95% H-UCL			137.1	90% Chebyshev (MVUE) UCL			126.2											
348	95% Chebyshev (MVUE) UCL			150.1	97.5% Chebyshev (MVUE) UCL			183.3											
349	99% Chebyshev (MVUE) UCL			248.6															
350	Nonparametric Distribution Free UCL Statistics																		
351	Data do not follow a Discernible Distribution (0.05)																		
352	Nonparametric Distribution Free UCLs																		
353	95% CLT UCL			145.1	95% Jackknife UCL			149.6											
354	95% Standard Bootstrap UCL			143.1	95% Bootstrap-t UCL			431.9											
355	95% Hall's Bootstrap UCL			422.1	95% Percentile Bootstrap UCL			152.4											
356	95% BCA Bootstrap UCL			195.6															
357	90% Chebyshev(Mean, Sd) UCL			193.9	95% Chebyshev(Mean, Sd) UCL			242.9											
358	97.5% Chebyshev(Mean, Sd) UCL			310.8	99% Chebyshev(Mean, Sd) UCL			444.3											
359	Suggested UCL to Use																		
360	95% Chebyshev (Mean, Sd) UCL			242.9															
361																			

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L										
362	Mercury																					
363	General Statistics																					
364	Total Number of Observations			14	Number of Distinct Observations			14														
365					Number of Missing Observations			0														
366	Minimum			0.0056	Mean			0.0457														
367	Maximum			0.25	Median			0.0222														
368	SD			0.0671	Std. Error of Mean			0.0179														
369	Coefficient of Variation			1.468	Skewness			2.654														
370	Normal GOF Test																					
371	Shapiro Wilk Test Statistic			0.581	Shapiro Wilk GOF Test																	
372	5% Shapiro Wilk Critical Value			0.874	Data Not Normal at 5% Significance Level																	
373	Lilliefors Test Statistic			0.394	Lilliefors GOF Test																	
374	5% Lilliefors Critical Value			0.226	Data Not Normal at 5% Significance Level																	
375	Data Not Normal at 5% Significance Level																					
376	Assuming Normal Distribution																					
377	95% Normal UCL				95% UCLs (Adjusted for Skewness)																	
378	95% Student's-t UCL				0.0775	95% Adjusted-CLT UCL (Chen-1995)			0.0888													
379						95% Modified-t UCL (Johnson-1978)			0.0796													
380	Gamma GOF Test																					
381	A-D Test Statistic			1.31	Anderson-Darling Gamma GOF Test																	
382	5% A-D Critical Value			0.761	Data Not Gamma Distributed at 5% Significance Level																	
383	K-S Test Statistic			0.333	Kolmogorov-Smirnov Gamma GOF Test																	
384	5% K-S Critical Value			0.235	Data Not Gamma Distributed at 5% Significance Level																	
385	Data Not Gamma Distributed at 5% Significance Level																					
386	Gamma Statistics																					
387	k hat (MLE)			0.975	k star (bias corrected MLE)			0.814														
388	Theta hat (MLE)			0.0469	Theta star (bias corrected MLE)			0.0562														
389	nu hat (MLE)			27.31	nu star (bias corrected)			22.79														
390	MLE Mean (bias corrected)			0.0457	MLE Sd (bias corrected)			0.0507														
391					Approximate Chi Square Value (0.05)			12.93														
392	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			11.96														
393	Assuming Gamma Distribution																					
394	95% Approximate Gamma UCL (use when n>=50)				0.0806	95% Adjusted Gamma UCL (use when n<50)			0.0871													
395	Lognormal GOF Test																					
396	Shapiro Wilk Test Statistic			0.902	Shapiro Wilk Lognormal GOF Test																	
397	5% Shapiro Wilk Critical Value			0.874	Data appear Lognormal at 5% Significance Level																	
398	Lilliefors Test Statistic			0.257	Lilliefors Lognormal GOF Test																	
399	5% Lilliefors Critical Value			0.226	Data Not Lognormal at 5% Significance Level																	
400	Data appear Approximate Lognormal at 5% Significance Level																					
401	Lognormal Statistics																					
402	Minimum of Logged Data			-5.185	Mean of logged Data			-3.679														
403	Maximum of Logged Data			-1.386	SD of logged Data			1.017														
404	Assuming Lognormal Distribution																					
405	95% H-UCL			0.0939	90% Chebyshev (MVUE) UCL			0.076														
406	95% Chebyshev (MVUE) UCL			0.0921	97.5% Chebyshev (MVUE) UCL			0.115														
407	99% Chebyshev (MVUE) UCL			0.159																		
408	Nonparametric Distribution Free UCL Statistics																					
409	Data appear to follow a Discernible Distribution at 5% Significance Level																					
410	Nonparametric Distribution Free UCLs																					
411	95% CLT UCL			0.0752	95% Jackknife UCL			0.0775														
412	95% Standard Bootstrap UCL			0.0744	95% Bootstrap-t UCL			0.184														
413	95% Hall's Bootstrap UCL			0.195	95% Percentile Bootstrap UCL			0.0774														
414	95% BCA Bootstrap UCL			0.0947																		
415	90% Chebyshev(Mean, Sd) UCL			0.0995	95% Chebyshev(Mean, Sd) UCL			0.124														
416	97.5% Chebyshev(Mean, Sd) UCL			0.158	99% Chebyshev(Mean, Sd) UCL			0.224														
417	Suggested UCL to Use																					
418	95% Chebyshev (Mean, Sd) UCL				0.124																	
419																						

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L								
Selenium																				
General Statistics																				
422	Total Number of Observations		14	Number of Distinct Observations		14	Number of Distinct Observations		14											
423	Number of Detects		12	Number of Non-Detects		2			2											
424	Number of Distinct Detects		12	Number of Distinct Non-Detects		2			2											
425	Minimum Detect		0.289	Minimum Non-Detect		0.234			0.234											
426	Maximum Detect		0.757	Maximum Non-Detect		0.32			0.32											
427	Variance Detects		0.0231	Percent Non-Detects		14.29%			14.29%											
428	Mean Detects		0.466	SD Detects		0.152			0.152											
429	Median Detects		0.45	CV Detects		0.326			0.326											
430	Skewness Detects		0.51	Kurtosis Detects		-0.769			-0.769											
431	Mean of Logged Detects		-0.812	SD of Logged Detects		0.325			0.325											
Normal GOF Test on Detects Only																				
433	Shapiro Wilk Test Statistic		0.93	Shapiro Wilk GOF Test																
434	5% Shapiro Wilk Critical Value		0.859	Detected Data appear Normal at 5% Significance Level																
435	Lilliefors Test Statistic		0.171	Lilliefors GOF Test																
436	5% Lilliefors Critical Value		0.243	Detected Data appear Normal at 5% Significance Level																
Detected Data appear Normal at 5% Significance Level																				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																				
439	KM Mean		0.436	KM Standard Error of Mean		0.0432														
440	KM SD		0.154	95% KM (BCA) UCL		0.508														
441	95% KM (t) UCL		0.512	95% KM (Percentile Bootstrap) UCL		0.504														
442	95% KM (z) UCL		0.507	95% KM Bootstrap t UCL		0.525														
443	90% KM Chebyshev UCL		0.565	95% KM Chebyshev UCL		0.624														
444	97.5% KM Chebyshev UCL		0.705	99% KM Chebyshev UCL		0.865														
Gamma GOF Tests on Detected Observations Only																				
446	A-D Test Statistic		0.338	Anderson-Darling GOF Test																
447	5% A-D Critical Value		0.73	Detected data appear Gamma Distributed at 5% Significance Level																
448	K-S Test Statistic		0.151	Kolmogorov-Smirnov GOF																
449	5% K-S Critical Value		0.245	Detected data appear Gamma Distributed at 5% Significance Level																
Detected data appear Gamma Distributed at 5% Significance Level																				
Gamma Statistics on Detected Data Only																				
452	k hat (MLE)		10.48	k star (bias corrected MLE)		7.915														
453	Theta hat (MLE)		0.0445	Theta star (bias corrected MLE)		0.0589														
454	nu hat (MLE)		251.5	nu star (bias corrected)		190														
455	Mean (detects)		0.466																	
Gamma ROS Statistics using Imputed Non-Detects																				
457	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																			
458	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																			
459	For such situations, GROS method may yield incorrect values of UCLs and BTVs																			
460	This is especially true when the sample size is small.																			
461	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																			
462	Minimum		0.152	Mean		0.427														
463	Maximum		0.757	Median		0.385														
464	SD		0.172	CV		0.403														
465	k hat (MLE)		6.177	k star (bias corrected MLE)		4.901														
466	Theta hat (MLE)		0.0692	Theta star (bias corrected MLE)		0.0872														
467	nu hat (MLE)		173	nu star (bias corrected)		137.2														
468	Adjusted Level of Significance (β)		0.0312																	
469	Approximate Chi Square Value (137.22, α)		111.2	Adjusted Chi Square Value (137.22, β)		108														
470	95% Gamma Approximate UCL (use when n>=50)		0.528	95% Gamma Adjusted UCL (use when n<50)		0.543														
Estimates of Gamma Parameters using KM Estimates																				
472	Mean (KM)		0.436	SD (KM)		0.154														
473	Variance (KM)		0.0239	SE of Mean (KM)		0.0432														
474	k hat (KM)		7.953	k star (KM)		6.297														
475	nu hat (KM)		222.7	nu star (KM)		176.3														
476	theta hat (KM)		0.0548	theta star (KM)		0.0692														
477	80% gamma percentile (KM)		0.571	90% gamma percentile (KM)		0.668														
478	95% gamma percentile (KM)		0.755	99% gamma percentile (KM)		0.937														
Gamma Kaplan-Meier (KM) Statistics																				
480	Approximate Chi Square Value (176.31, α)		146.6	Adjusted Chi Square Value (176.31, β)		143														

**East Ditch South Representative Concentrations
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L
481		95% Gamma Approximate KM-UCL (use when n>=50)			0.524		95% Gamma Adjusted KM-UCL (use when n<50)			0.537		
Lognormal GOF Test on Detected Observations Only												
482		Shapiro Wilk Test Statistic		0.94								
483		5% Shapiro Wilk Critical Value		0.859			Detected Data appear Lognormal at 5% Significance Level					
484		Lilliefors Test Statistic		0.144								
485		5% Lilliefors Critical Value		0.243			Detected Data appear Lognormal at 5% Significance Level					
486		Detected Data appear Lognormal at 5% Significance Level										
487		Lognormal ROS Statistics Using Imputed Non-Detects										
488		Mean in Original Scale		0.432			Mean in Log Scale		-0.908			
489		SD in Original Scale		0.165			SD in Log Scale		0.389			
490		95% t UCL (assumes normality of ROS data)		0.51			95% Percentile Bootstrap UCL		0.508			
491		95% BCA Bootstrap UCL		0.508			95% Bootstrap t UCL		0.519			
492		95% H-UCL (Log ROS)		0.539								
493		Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
494		KM Mean (logged)		-0.893			KM Geo Mean		0.409			
495		KM SD (logged)		0.353			95% Critical H Value (KM-Log)		1.94			
496		KM Standard Error of Mean (logged)		0.0988			95% H-UCL (KM -Log)		0.527			
497		KM SD (logged)		0.353			95% Critical H Value (KM-Log)		1.94			
498		KM Standard Error of Mean (logged)		0.0988								
499		DL/2 Statistics										
500		DL/2 Normal				DL/2 Log-Transformed						
501		Mean in Original Scale		0.419			Mean in Log Scale		-0.98			
502		SD in Original Scale		0.184			SD in Log Scale		0.526			
503		95% t UCL (Assumes normality)		0.506			95% H-Stat UCL		0.58			
504		DL/2 is not a recommended method, provided for comparisons and historical reasons										
505		Nonparametric Distribution Free UCL Statistics										
506		Detected Data appear Normal Distributed at 5% Significance Level										
507		Suggested UCL to Use										
508		95% KM (t) UCL		0.512								
509												

East Ditch South Segment
Summary of 95% Upper Confidence Limits (UCLs) (mg/kg)
Brine Service Company Superfund Site

COPC	2018	95% UCL	Comment
Barium	1347	95% Adjusted Gamma UCL	
Beryllium	0.488	95% Student's t UCL	
Cadmium	1.477	95% Chebyshev (Mean, Sd) UCL	
Copper	12.47	95% Student's t UCL	
Lead	39.88	95% Student's t UCL	
Manganese	361	95% Student's t UCL	
Nickel	6.602	95% Student's t UCL	
Selenium	0.512	95% KM (t) UCL	
Thallium	0.188	95% KM (t) UCL	
Vanadium	15	95% Student's t UCL	
Zinc	242.9	95% Chebyshev (Mean, Sd) UCL	
Mercury	0.124	95% Chebyshev (Mean, Sd) UCL	
bis(2-Ethylhexyl) phthalate	0.258	95% Gamma Adjusted KM-UCL	
Total PAHs	0.733	95% Adjusted Gamma UCL	

East Ditch North Segment
Summary of 95% Upper Confidence Limits (UCLs) (mg/kg)
Brine Service Company Superfund Site

COPC	2018	95% UCL	Comment
Barium	2704	95% H-UCL	
Beryllium	0.382	95% Student's t UCL	
Lead	65.66	95% H-UCL	
Manganese	945.3	95% H-UCL	
Selenium	0.844	95% KM (t) UCL	
Thallium	0.142	95% KM (t) UCL	
Vanadium	12.15	95% Student's t UCL	
Zinc	239.3	95% Student's t UCL	
Mercury	0.245	95% Student's t UCL	
Cyanide	1.125	95% KM (t) UCL	
bis(2-Ethylhexyl) phthalate	0.432	Gamma Adjusted KM-UCL	
Carbazole	0.228	95% Chebyshev (Mean, Sd) UCL	
Low Molecular Weight PAHs	2.026	95% Chebyshev (Mean, Sd) UCL	
High Molecular Weight PAHs	11.62	95% Chebyshev (Mean, Sd) UCL	
Total PAHs	17.98	95% Chebyshev (Mean, Sd) UCL	

Sediment Analytical Data Summary
East Ditch South (Freshwater)
Brine Service Company Superfund Site

Sample Location	Depth Interval	Barium	Beryllium	Cadmium	Copper	Lead	Manganese	Nickel	Vanadium	Zinc	Mercury	Cyanide	D_Cyanide	44-DDT	D_44-DDT	beta-BHC	D_beta-BHC	gamma-Chlordane	gamma-Chlordan	BEP	D_BEP	TPAH	Selenium	Selenium	Thallium	D_Thallium
EDSSD01	0-0.5 ft	978	0.560	0.352	11.9	33.0	514	8.46	17.7	60.1	0.0246	1.0	0	0.0043	0	0.0026	0	0.0017	0	0.57	1	0.4977	0.757	1	0.268	1
EDSSD01	0-0.5 ft	594	0.480	0.266	9.11	22.8	253	6.06	13.1	45.6	0.0213	0.93	0	0.0039	0	0.0024	0	0.0016	0	0.012	1	0.2085	0.512	1	0.139	1
EDSSD02	0-0.5 ft	567	0.331	0.192	5.25	14.1	559	5.03	15.7	22.4	0.00735	0.79	0	0.0034	0	0.0020	0	0.0013	0	0.044	0	0.371	1	0.0952	1	
EDSSD03	0-0.5 ft	484	0.248	0.355	5.26	12.6	262	4.26	9.79	48.0	0.0219	0.75	0	0.0032	0	0.0019	0	0.0013	0	0.018	1	0.1541	0.399	1	0.079	0
EDSSD04	0-0.5 ft	1250	0.332	0.333	7.49	18.0	314	5.69	13.4	48.3	0.0225	0.84	0	0.024	1	0.040	1	0.028	1	0.023	1	0.2361	0.501	1	0.091	0
EDSSD05	0-0.5 ft	264	0.219	0.097	3.28	6.41	252	2.98	10.2	15.6	0.0056	0.79	0	0.0033	0	0.0020	0	0.0013	0	0.0087	0	0.0657	0.32	0	0.089	0
EDSSD06	0-0.5 ft	395	0.614	0.312	7.8	11.2	253	6.93	14.3	33.9	0.0143	0.94	0	0.0040	0	0.0024	0	0.0016	0	0.023	1	0.2032	0.59	1	0.217	1
EDSSD07	0-0.5 ft	586	0.477	0.327	6.37	14.0	379	5.44	13.8	32.8	0.0128	0.88	0	0.0037	0	0.0022	0	0.0015	0	0.012	1	0.1021	0.571	1	0.234	1
EDSSD08	0-0.5 ft	674	0.568	0.394	12.5	77.0	280	6.47	14.2	78.9	0.0184	0.99	1	0.0039	0	0.0023	0	0.0015	0	0.035	1	0.2756	0.641	1	0.288	1
EDSSD03A	0-6 in	1460	0.293	0.211	7.18	20.4	155	5.36	12.4	35.2	0.134									0.056	1	0.302	0.29	1	0.14	1
EDSSD03B	0-6 in	1840	0.364	0.374	10.5	35.4	468	5.85	12.8	55.6	0.023									0.063	1	0.587	0.234	0	0.108	1
EDSSD03C	0-6 in	2690	0.621	0.626	21.5	76.3	166	8.53	19.8	124	0.057									0.092	1	0.61	0.324	1	0.203	1
EDSSD03D	0-6 in	646	0.499	3.32	20.6	42.1	175	7.03	14.3	545	0.250									0.092	1	1.87	0.35	1	0.126	1
EDSSD03E	0-6 in	383	0.294	0.28	10.1	26.2	115	3.71	9.51	55.9	0.0272									0.13	1	0.424	0.289	1	0.093	0

Max	2690	0.621	3.32	21.5	77.0	559	8.53	19.8	545	0.250	1.0	0.024	0.040	0.028	0.570	1.870	0.757	0.288
Min	264	0.219	0.0966	3.28	6.41	115	2.98	9.51	15.6	0.0056	0.75	0.0032	0.0019	0.0013	0.0087	0.0657	0.234	0.079
Average	915	0.421	0.531	9.92	29.3	296	5.84	13.6	85.8	0.0457	0.879	0.00597	0.0064	0.0044	0.0842	0.426	0.439	0.155
Count	14	14	14	14	14	14	14	14	14	9	9	9	9	9	14	13	14	14

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2	User Selected Options											
3	Date/Time of Computation ProUCL 5.112/26/2017 6:52:32 PM											
4	From File 171222 Sediment UCLs.xls											
5	Full Precision OFF											
6	Confidence Coefficient 95%											
7	Number of Bootstrap Operations 2000											

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
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Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L					
69							bis(2-Ethylhexyl) Phthalate										
70							General Statistics										
71				Total Number of Observations	14				Number of Distinct Observations	11							
72				Number of Detects	12				Number of Non-Detects	2							
73				Number of Distinct Detects	9				Number of Distinct Non-Detects	2							
74				Minimum Detect	0.012				Minimum Non-Detect	0.0087							
75				Maximum Detect	0.57				Maximum Non-Detect	0.044							
76				Variance Detects	0.0239				Percent Non-Detects	14.29%							
77				Mean Detects	0.0938				SD Detects	0.155							
78				Median Detects	0.0455				CV Detects	1.648							
79				Skewness Detects	3.111				Kurtosis Detects	10.18							
80				Mean of Logged Detects	-3.065				SD of Logged Detects	1.13							
81				Normal GOF Test on Detects Only													
82				Shapiro Wilk Test Statistic	0.541				Shapiro Wilk GOF Test								
83				5% Shapiro Wilk Critical Value	0.859				Detected Data Not Normal at 5% Significance Level								
84				Lilliefors Test Statistic	0.338				Lilliefors GOF Test								
85				5% Lilliefors Critical Value	0.243				Detected Data Not Normal at 5% Significance Level								
86				Detected Data Not Normal at 5% Significance Level													
87				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs													
88				KM Mean	0.0824				KM Standard Error of Mean	0.0391							
89				KM SD	0.14				95% KM (BCA) UCL	0.162							
90				95% KM (t) UCL	0.152				95% KM (Percentile Bootstrap) UCL	0.156							
91				95% KM (z) UCL	0.147				95% KM Bootstrap t UCL	0.307							
92				90% KM Chebyshev UCL	0.2				95% KM Chebyshev UCL	0.253							
93				97.5% KM Chebyshev UCL	0.326				99% KM Chebyshev UCL	0.471							
94				Gamma GOF Tests on Detected Observations Only													
95				A-D Test Statistic	0.752				Anderson-Darling GOF Test								
96				5% A-D Critical Value	0.762				Detected data appear Gamma Distributed at 5% Significance Level								
97				K-S Test Statistic	0.197				Kolmogorov-Smirnov GOF								
98				5% K-S Critical Value	0.254				Detected data appear Gamma Distributed at 5% Significance Level								
99				Detected data appear Gamma Distributed at 5% Significance Level													
100				Gamma Statistics on Detected Data Only													
101				k hat (MLE)	0.843				k star (bias corrected MLE)	0.688							
102				Theta hat (MLE)	0.111				Theta star (bias corrected MLE)	0.136							
103				nu hat (MLE)	20.24				nu star (bias corrected)	16.51							
104				Mean (detects)	0.0938												
105				Gamma ROS Statistics using Imputed Non-Detects													
106				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs													
107				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)													
108				For such situations, GROS method may yield incorrect values of UCLs and BTVs													
109				This is especially true when the sample size is small.													
110				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates													
111				Minimum	0.01				Mean	0.0819							
112				Maximum	0.57				Median	0.029							
113				SD	0.145				CV	1.777							
114				k hat (MLE)	0.763				k star (bias corrected MLE)	0.647							
115				Theta hat (MLE)	0.107				Theta star (bias corrected MLE)	0.126							
116				nu hat (MLE)	21.37				nu star (bias corrected)	18.13							
117				Adjusted Level of Significance (β)	0.0312												
118				Approximate Chi Square Value (18.13, α)	9.483				Adjusted Chi Square Value (18.13, β)	8.664							
119				95% Gamma Approximate UCL (use when n>=50)	0.156				95% Gamma Adjusted UCL (use when n<50)	0.171							
120				Estimates of Gamma Parameters using KM Estimates													
121				Mean (KM)	0.0824				SD (KM)	0.14							
122				Variance (KM)	0.0196				SE of Mean (KM)	0.0391							
123				k hat (KM)	0.347				k star (KM)	0.32							
124				nu hat (KM)	9.706				nu star (KM)	8.959							
125				theta hat (KM)	0.238				theta star (KM)	0.258							
126				80% gamma percentile (KM)	0.128				90% gamma percentile (KM)	0.241							
127				95% gamma percentile (KM)	0.369				99% gamma percentile (KM)	0.699							
128				Gamma Kaplan-Meier (KM) Statistics													
129				Approximate Chi Square Value (8.96, α)	3.302				Adjusted Chi Square Value (8.96, β)	2.862							

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L						
130		95% Gamma Approximate KM-UCL (use when n>=50)			0.224			95% Gamma Adjusted KM-UCL (use when n<50)			0.258							
Lognormal GOF Test on Detected Observations Only																		
132		Shapiro Wilk Test Statistic		0.931			Shapiro Wilk GOF Test											
133		5% Shapiro Wilk Critical Value		0.859			Detected Data appear Lognormal at 5% Significance Level											
134		Lilliefors Test Statistic		0.151			Lilliefors GOF Test											
135		5% Lilliefors Critical Value		0.243			Detected Data appear Lognormal at 5% Significance Level											
136	Detected Data appear Lognormal at 5% Significance Level																	
137	Lognormal ROS Statistics Using Imputed Non-Detects																	
138	Mean in Original Scale		0.0818				Mean in Log Scale		-3.328									
139	SD in Original Scale		0.146				SD in Log Scale		1.275									
140	95% t UCL (assumes normality of ROS data)		0.151				95% Percentile Bootstrap UCL		0.151									
141	95% BCA Bootstrap UCL		0.192				95% Bootstrap t UCL		0.313									
142	95% H-UCL (Log ROS)		0.257															
143	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																	
144	KM Mean (logged)		-3.257				KM Geo Mean		0.0385									
145	KM SD (logged)		1.12				95% Critical H Value (KM-Log)		2.994									
146	KM Standard Error of Mean (logged)		0.315				95% H-UCL (KM -Log)		0.183									
147	KM SD (logged)		1.12				95% Critical H Value (KM-Log)		2.994									
148	KM Standard Error of Mean (logged)		0.315															
149	DL/2 Statistics																	
150	DL/2 Normal				DL/2 Log-Transformed													
151	Mean in Original Scale		0.0823				Mean in Log Scale		-3.288									
152	SD in Original Scale		0.145				SD in Log Scale		1.226									
153	95% t UCL (Assumes normality)		0.151				95% H-Stat UCL		0.233									
154	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
155	Nonparametric Distribution Free UCL Statistics																	
156	Suggested UCL to Use																	
157	95% KM Bootstrap t UCL		0.307	ha Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)					0.258									
158																		
159																		

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
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Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
218							Cadmium					
219							General Statistics					
220				Total Number of Observations	14			Number of Distinct Observations	14			
221								Number of Missing Observations	0			
222				Minimum	0.0966					Mean	0.531	
223				Maximum	3.32					Median	0.33	
224				SD	0.812					Std. Error of Mean	0.217	
225				Coefficient of Variation	1.527					Skewness	3.602	
226						Normal GOF Test						
227				Shapiro Wilk Test Statistic	0.428		Shapiro Wilk GOF Test					
228				5% Shapiro Wilk Critical Value	0.874		Data Not Normal at 5% Significance Level					
229				Lilliefors Test Statistic	0.424		Lilliefors GOF Test					
230				5% Lilliefors Critical Value	0.226		Data Not Normal at 5% Significance Level					
231						Data Not Normal at 5% Significance Level						
232						Assuming Normal Distribution						
233						95% Normal UCL		95% UCLs (Adjusted for Skewness)				
234						95% Student's-t UCL	0.915	95% Adjusted-CLT UCL (Chen-1995)	1.111			
235								95% Modified-t UCL (Johnson-1978)	0.95			
236							Gamma GOF Test					
237						A-D Test Statistic	2.011	Anderson-Darling Gamma GOF Test				
238						5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level				
239						K-S Test Statistic	0.368	Kolmogorov-Smirnov Gamma GOF Test				
240						5% K-S Critical Value	0.234	Data Not Gamma Distributed at 5% Significance Level				
241							Data Not Gamma Distributed at 5% Significance Level					
242							Gamma Statistics					
243						k hat (MLE)	1.322	k star (bias corrected MLE)	1.086			
244						Theta hat (MLE)	0.402	Theta star (bias corrected MLE)	0.489			
245						nu hat (MLE)	37.01	nu star (bias corrected)	30.41			
246						MLE Mean (bias corrected)	0.531	MLE Sd (bias corrected)	0.51			
247								Approximate Chi Square Value (0.05)	18.82			
248						Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	17.61			
249							Assuming Gamma Distribution					
250						95% Approximate Gamma UCL (use when n>=50)	0.859	95% Adjusted Gamma UCL (use when n<50)	0.917			
251							Lognormal GOF Test					
252						Shapiro Wilk Test Statistic	0.8	Shapiro Wilk Lognormal GOF Test				
253						5% Shapiro Wilk Critical Value	0.874	Data Not Lognormal at 5% Significance Level				
254						Lilliefors Test Statistic	0.293	Lilliefors Lognormal GOF Test				
255						5% Lilliefors Critical Value	0.226	Data Not Lognormal at 5% Significance Level				
256							Data Not Lognormal at 5% Significance Level					
257							Lognormal Statistics					
258						Minimum of Logged Data	-2.337	Mean of logged Data	-1.056			
259						Maximum of Logged Data	1.2	SD of logged Data	0.776			
260							Assuming Lognormal Distribution					
261						95% H-UCL	0.796	90% Chebyshev (MVUE) UCL	0.76			
262						95% Chebyshev (MVUE) UCL	0.897	97.5% Chebyshev (MVUE) UCL	1.086			
263						99% Chebyshev (MVUE) UCL	1.459					
264							Nonparametric Distribution Free UCL Statistics					
265							Data do not follow a Discernible Distribution (0.05)					
266							Nonparametric Distribution Free UCLs					
267						95% CLT UCL	0.888	95% Jackknife UCL	0.915			
268						95% Standard Bootstrap UCL	0.873	95% Bootstrap-t UCL	3.027			
269						95% Hall's Bootstrap UCL	3.108	95% Percentile Bootstrap UCL	0.956			
270						95% BCA Bootstrap UCL	1.211					
271						90% Chebyshev(Mean, Sd) UCL	1.182	95% Chebyshev(Mean, Sd) UCL	1.477			
272						97.5% Chebyshev(Mean, Sd) UCL	1.886	99% Chebyshev(Mean, Sd) UCL	2.689			
273							Suggested UCL to Use					
274						95% Chebyshev (Mean, Sd) UCL	1.477					
275												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
276							Copper					
277							General Statistics					
278				Total Number of Observations	14			Number of Distinct Observations	14			
279								Number of Missing Observations	0			
280				Minimum	3.28					Mean	9.917	
281				Maximum	21.5					Median	8.455	
282				SD	5.391			Std. Error of Mean	1.441			
283				Coefficient of Variation	0.544					Skewness	1.268	
284						Normal GOF Test						
285				Shapiro Wilk Test Statistic	0.864		Shapiro Wilk GOF Test					
286				5% Shapiro Wilk Critical Value	0.874			Data Not Normal at 5% Significance Level				
287				Lilliefors Test Statistic	0.173		Lilliefors GOF Test					
288				5% Lilliefors Critical Value	0.226			Data appear Normal at 5% Significance Level				
289						Data appear Approximate Normal at 5% Significance Level						
290						Assuming Normal Distribution						
291						95% Normal UCL		95% UCLs (Adjusted for Skewness)				
292						95% Student's-t UCL	12.47	95% Adjusted-CLT UCL (Chen-1995)	12.81			
293								95% Modified-t UCL (Johnson-1978)	12.55			
294							Gamma GOF Test					
295						A-D Test Statistic	0.311	Anderson-Darling Gamma GOF Test				
296						5% A-D Critical Value	0.74		Detected data appear Gamma Distributed at 5% Significance Level			
297						K-S Test Statistic	0.119	Kolmogorov-Smirnov Gamma GOF Test				
298						5% K-S Critical Value	0.23		Detected data appear Gamma Distributed at 5% Significance Level			
299							Detected data appear Gamma Distributed at 5% Significance Level					
300							Gamma Statistics					
301						k hat (MLE)	4.15		k star (bias corrected MLE)	3.308		
302						Theta hat (MLE)	2.39		Theta star (bias corrected MLE)	2.997		
303						nu hat (MLE)	116.2		nu star (bias corrected)	92.64		
304						MLE Mean (bias corrected)	9.917		MLE Sd (bias corrected)	5.452		
305									Approximate Chi Square Value (0.05)	71.44		
306						Adjusted Level of Significance	0.0312		Adjusted Chi Square Value	68.98		
307							Assuming Gamma Distribution					
308						95% Approximate Gamma UCL (use when n>=50)	12.86		95% Adjusted Gamma UCL (use when n<50)	13.32		
309							Lognormal GOF Test					
310						Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Lognormal GOF Test				
311						5% Shapiro Wilk Critical Value	0.874		Data appear Lognormal at 5% Significance Level			
312						Lilliefors Test Statistic	0.102	Lilliefors Lognormal GOF Test				
313						5% Lilliefors Critical Value	0.226		Data appear Lognormal at 5% Significance Level			
314							Data appear Lognormal at 5% Significance Level					
315							Lognormal Statistics					
316						Minimum of Logged Data	1.188		Mean of logged Data	2.169		
317						Maximum of Logged Data	3.068		SD of logged Data	0.517		
318							Assuming Lognormal Distribution					
319						95% H-UCL	13.38		90% Chebyshev (MVUE) UCL	14.12		
320						95% Chebyshev (MVUE) UCL	16.04		97.5% Chebyshev (MVUE) UCL	18.7		
321						99% Chebyshev (MVUE) UCL	23.92					
322							Nonparametric Distribution Free UCL Statistics					
323							Data appear to follow a Discernible Distribution at 5% Significance Level					
324							Nonparametric Distribution Free UCLs					
325						95% CLT UCL	12.29		95% Jackknife UCL	12.47		
326						95% Standard Bootstrap UCL	12.16		95% Bootstrap-t UCL	13.96		
327						95% Hall's Bootstrap UCL	16.37		95% Percentile Bootstrap UCL	12.39		
328						95% BCA Bootstrap UCL	12.95					
329						90% Chebyshev(Mean, Sd) UCL	14.24		95% Chebyshev(Mean, Sd) UCL	16.2		
330						97.5% Chebyshev(Mean, Sd) UCL	18.92		99% Chebyshev(Mean, Sd) UCL	24.25		
331							Suggested UCL to Use					
332						95% Student's-t UCL	12.47					
333								When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test				
334								When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL				
335												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
336							Lead					
337							General Statistics					
338				Total Number of Observations	14			Number of Distinct Observations	14			
339								Number of Missing Observations	0			
340				Minimum	6.41					Mean	29.25	
341				Maximum	77					Median	21.6	
342				SD	22.45			Std. Error of Mean	6.001			
343				Coefficient of Variation	0.768					Skewness	1.456	
344						Normal GOF Test						
345				Shapiro Wilk Test Statistic	0.808		Shapiro Wilk GOF Test					
346				5% Shapiro Wilk Critical Value	0.874			Data Not Normal at 5% Significance Level				
347				Lilliefors Test Statistic	0.197		Lilliefors GOF Test					
348				5% Lilliefors Critical Value	0.226			Data appear Normal at 5% Significance Level				
349						Data appear Approximate Normal at 5% Significance Level						
350						Assuming Normal Distribution						
351						95% Normal UCL		95% UCLs (Adjusted for Skewness)				
352						95% Student's-t UCL	39.88	95% Adjusted-CLT UCL (Chen-1995)	41.62			
353								95% Modified-t UCL (Johnson-1978)	40.27			
354							Gamma GOF Test					
355						A-D Test Statistic	0.391	Anderson-Darling Gamma GOF Test				
356						5% A-D Critical Value	0.745		Detected data appear Gamma Distributed at 5% Significance Level			
357						K-S Test Statistic	0.125	Kolmogorov-Smirnov Gamma GOF Test				
358						5% K-S Critical Value	0.231		Detected data appear Gamma Distributed at 5% Significance Level			
359							Detected data appear Gamma Distributed at 5% Significance Level					
360							Gamma Statistics					
361						k hat (MLE)	2.217		k star (bias corrected MLE)	1.79		
362						Theta hat (MLE)	13.19		Theta star (bias corrected MLE)	16.34		
363						nu hat (MLE)	62.09		nu star (bias corrected)	50.11		
364						MLE Mean (bias corrected)	29.25		MLE Sd (bias corrected)	21.86		
365									Approximate Chi Square Value (0.05)	34.86		
366						Adjusted Level of Significance	0.0312		Adjusted Chi Square Value	33.18		
367							Assuming Gamma Distribution					
368						95% Approximate Gamma UCL (use when n>=50)	42.05		95% Adjusted Gamma UCL (use when n<50)	44.18		
369							Lognormal GOF Test					
370						Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Lognormal GOF Test				
371						5% Shapiro Wilk Critical Value	0.874		Data appear Lognormal at 5% Significance Level			
372						Lilliefors Test Statistic	0.109	Lilliefors Lognormal GOF Test				
373						5% Lilliefors Critical Value	0.226		Data appear Lognormal at 5% Significance Level			
374							Data appear Lognormal at 5% Significance Level					
375							Lognormal Statistics					
376						Minimum of Logged Data	1.858		Mean of logged Data	3.134		
377						Maximum of Logged Data	4.344		SD of logged Data	0.716		
378							Assuming Lognormal Distribution					
379						95% H-UCL	47.41		90% Chebyshev (MVUE) UCL	46.57		
380						95% Chebyshev (MVUE) UCL	54.52		97.5% Chebyshev (MVUE) UCL	65.55		
381						99% Chebyshev (MVUE) UCL	87.21					
382							Nonparametric Distribution Free UCL Statistics					
383							Data appear to follow a Discernible Distribution at 5% Significance Level					
384							Nonparametric Distribution Free UCLs					
385						95% CLT UCL	39.12		95% Jackknife UCL	39.88		
386						95% Standard Bootstrap UCL	39.07		95% Bootstrap-t UCL	48.24		
387						95% Hall's Bootstrap UCL	58.14		95% Percentile Bootstrap UCL	39.97		
388						95% BCA Bootstrap UCL	41.06					
389						90% Chebyshev(Mean, Sd) UCL	47.25		95% Chebyshev(Mean, Sd) UCL	55.41		
390						97.5% Chebyshev(Mean, Sd) UCL	66.72		99% Chebyshev(Mean, Sd) UCL	88.96		
391							Suggested UCL to Use					
392						95% Student's-t UCL	39.88					
393								When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test				
394								When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL				
395												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
396												
397												
398				Total Number of Observations	14				Number of Distinct Observations	13		
399									Number of Missing Observations	0		
400				Minimum	115				Mean	296.1		
401				Maximum	559				Median	257.5		
402				SD	137.2				Std. Error of Mean	36.67		
403				Coefficient of Variation	0.463				Skewness	0.736		
404												
405				Shapiro Wilk Test Statistic	0.915				Shapiro Wilk GOF Test			
406				5% Shapiro Wilk Critical Value	0.874				Data appear Normal at 5% Significance Level			
407				Lilliefors Test Statistic	0.189				Lilliefors GOF Test			
408				5% Lilliefors Critical Value	0.226				Data appear Normal at 5% Significance Level			
409												
410									Assuming Normal Distribution			
411				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
412				95% Student's-t UCL	361				95% Adjusted-CLT UCL (Chen-1995)	364.1		
413									95% Modified-t UCL (Johnson-1978)	362.2		
414												
415				A-D Test Statistic	0.326				Anderson-Darling Gamma GOF Test			
416				5% A-D Critical Value	0.738				Detected data appear Gamma Distributed at 5% Significance Level			
417				K-S Test Statistic	0.134				Kolmogorov-Smirnov Gamma GOF Test			
418				5% K-S Critical Value	0.229				Detected data appear Gamma Distributed at 5% Significance Level			
419									Detected data appear Gamma Distributed at 5% Significance Level			
420												
421				k hat (MLE)	5.16				k star (bias corrected MLE)	4.102		
422				Theta hat (MLE)	57.38				Theta star (bias corrected MLE)	72.18		
423				nu hat (MLE)	144.5				nu star (bias corrected)	114.9		
424				MLE Mean (bias corrected)	296.1				MLE Sd (bias corrected)	146.2		
425									Approximate Chi Square Value (0.05)	91.12		
426				Adjusted Level of Significance	0.0312				Adjusted Chi Square Value	88.31		
427												
428				95% Approximate Gamma UCL (use when n>=50)	373.2				95% Adjusted Gamma UCL (use when n<50)	385.1		
429												
430				Shapiro Wilk Test Statistic	0.961				Shapiro Wilk Lognormal GOF Test			
431				5% Shapiro Wilk Critical Value	0.874				Data appear Lognormal at 5% Significance Level			
432				Lilliefors Test Statistic	0.162				Lilliefors Lognormal GOF Test			
433				5% Lilliefors Critical Value	0.226				Data appear Lognormal at 5% Significance Level			
434									Detected data appear Lognormal at 5% Significance Level			
435												
436				Minimum of Logged Data	4.745				Mean of logged Data	5.591		
437				Maximum of Logged Data	6.326				SD of logged Data	0.469		
438												
439				95% H-UCL	388.3				90% Chebyshev (MVUE) UCL	410.8		
440				95% Chebyshev (MVUE) UCL	462.6				97.5% Chebyshev (MVUE) UCL	534.4		
441				99% Chebyshev (MVUE) UCL	675.6							
442												
443												
444												
445				95% CLT UCL	356.4				95% Jackknife UCL	361		
446				95% Standard Bootstrap UCL	353				95% Bootstrap-t UCL	380.3		
447				95% Hall's Bootstrap UCL	360.5				95% Percentile Bootstrap UCL	354.2		
448				95% BCA Bootstrap UCL	358.2							
449				90% Chebyshev(Mean, Sd) UCL	406.1				95% Chebyshev(Mean, Sd) UCL	455.9		
450				97.5% Chebyshev(Mean, Sd) UCL	525.1				99% Chebyshev(Mean, Sd) UCL	660.9		
451												
452				95% Student's-t UCL	361							
453												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
454							Nickel					
455							General Statistics					
456			Total Number of Observations	14			Number of Distinct Observations	14				
457							Number of Missing Observations	0				
458			Minimum	2.98					Mean	5.843		
459			Maximum	8.53					Median	5.77		
460			SD	1.604					Std. Error of Mean	0.429		
461			Coefficient of Variation	0.274					Skewness	0.0586		
462							Normal GOF Test					
463			Shapiro Wilk Test Statistic	0.972			Shapiro Wilk GOF Test					
464			5% Shapiro Wilk Critical Value	0.874			Data appear Normal at 5% Significance Level					
465			Lilliefors Test Statistic	0.096			Lilliefors GOF Test					
466			5% Lilliefors Critical Value	0.226			Data appear Normal at 5% Significance Level					
467							Data appear Normal at 5% Significance Level					
468							Assuming Normal Distribution					
469			95% Normal UCL				95% UCLs (Adjusted for Skewness)					
470			95% Student's-t UCL	6.602			95% Adjusted-CLT UCL (Chen-1995)	6.555				
471							95% Modified-t UCL (Johnson-1978)	6.603				
472							Gamma GOF Test					
473			A-D Test Statistic	0.219			Anderson-Darling Gamma GOF Test					
474			5% A-D Critical Value	0.734			Detected data appear Gamma Distributed at 5% Significance Level					
475			K-S Test Statistic	0.128			Kolmogorov-Smirnov Gamma GOF Test					
476			5% K-S Critical Value	0.229			Detected data appear Gamma Distributed at 5% Significance Level					
477							Detected data appear Gamma Distributed at 5% Significance Level					
478							Gamma Statistics					
479			k hat (MLE)	13.28			k star (bias corrected MLE)	10.48				
480			Theta hat (MLE)	0.44			Theta star (bias corrected MLE)	0.557				
481			nu hat (MLE)	371.9			nu star (bias corrected)	293.5				
482			MLE Mean (bias corrected)	5.843			MLE Sd (bias corrected)	1.805				
483							Approximate Chi Square Value (0.05)	254.8				
484			Adjusted Level of Significance	0.0312			Adjusted Chi Square Value	250.1				
485							Assuming Gamma Distribution					
486			95% Approximate Gamma UCL (use when n>=50)	6.73			95% Adjusted Gamma UCL (use when n<50)	6.858				
487							Lognormal GOF Test					
488			Shapiro Wilk Test Statistic	0.955			Shapiro Wilk Lognormal GOF Test					
489			5% Shapiro Wilk Critical Value	0.874			Data appear Lognormal at 5% Significance Level					
490			Lilliefors Test Statistic	0.149			Lilliefors Lognormal GOF Test					
491			5% Lilliefors Critical Value	0.226			Data appear Lognormal at 5% Significance Level					
492							Data appear Lognormal at 5% Significance Level					
493							Lognormal Statistics					
494			Minimum of Logged Data	1.092			Mean of logged Data	1.727				
495			Maximum of Logged Data	2.144			SD of logged Data	0.295				
496							Assuming Lognormal Distribution					
497			95% H-UCL	6.856			90% Chebyshev (MVUE) UCL	7.254				
498			95% Chebyshev (MVUE) UCL	7.887			97.5% Chebyshev (MVUE) UCL	8.767				
499			99% Chebyshev (MVUE) UCL	10.49								
500							Nonparametric Distribution Free UCL Statistics					
501							Data appear to follow a Discernible Distribution at 5% Significance Level					
502							Nonparametric Distribution Free UCLs					
503			95% CLT UCL	6.548			95% Jackknife UCL	6.602				
504			95% Standard Bootstrap UCL	6.519			95% Bootstrap-t UCL	6.63				
505			95% Hall's Bootstrap UCL	6.596			95% Percentile Bootstrap UCL	6.512				
506			95% BCA Bootstrap UCL	6.521								
507			90% Chebyshev(Mean, Sd) UCL	7.129			95% Chebyshev(Mean, Sd) UCL	7.711				
508			97.5% Chebyshev(Mean, Sd) UCL	8.519			99% Chebyshev(Mean, Sd) UCL	10.11				
509							Suggested UCL to Use					
510			95% Student's-t UCL	6.602								
511												

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
512	Vanadium																		
513	General Statistics																		
514	Total Number of Observations			14	Number of Distinct Observations			13											
515					Number of Missing Observations			0											
516	Minimum			9.51	Mean			13.64											
517	Maximum			19.8	Median			13.6											
518	SD			2.858	Std. Error of Mean			0.764											
519	Coefficient of Variation			0.209	Skewness			0.532											
520	Normal GOF Test																		
521	Shapiro Wilk Test Statistic			0.941	Shapiro Wilk GOF Test														
522	5% Shapiro Wilk Critical Value			0.874	Data appear Normal at 5% Significance Level														
523	Lilliefors Test Statistic			0.195	Lilliefors GOF Test														
524	5% Lilliefors Critical Value			0.226	Data appear Normal at 5% Significance Level														
525	Data appear Normal at 5% Significance Level																		
526	Assuming Normal Distribution																		
527	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
528	95% Student's-t UCL			15	95% Adjusted-CLT UCL (Chen-1995)			15.02											
529					95% Modified-t UCL (Johnson-1978)			15.01											
530	Gamma GOF Test																		
531	A-D Test Statistic			0.362	Anderson-Darling Gamma GOF Test														
532	5% A-D Critical Value			0.734	Detected data appear Gamma Distributed at 5% Significance Level														
533	K-S Test Statistic			0.167	Kolmogorov-Smirnov Gamma GOF Test														
534	5% K-S Critical Value			0.228	Detected data appear Gamma Distributed at 5% Significance Level														
535	Detected data appear Gamma Distributed at 5% Significance Level																		
536	Gamma Statistics																		
537	k hat (MLE)			24.94	k star (bias corrected MLE)			19.64											
538	Theta hat (MLE)			0.547	Theta star (bias corrected MLE)			0.695											
539	nu hat (MLE)			698.2	nu star (bias corrected)			549.9											
540	MLE Mean (bias corrected)			13.64	MLE Sd (bias corrected)			3.078											
541					Approximate Chi Square Value (0.05)			496.6											
542	Adjusted Level of Significance			0.0312	Adjusted Chi Square Value			489.8											
543	Assuming Gamma Distribution																		
544	95% Approximate Gamma UCL (use when n>=50)			15.11	95% Adjusted Gamma UCL (use when n<50)			15.32											
545	Lognormal GOF Test																		
546	Shapiro Wilk Test Statistic			0.95	Shapiro Wilk Lognormal GOF Test														
547	5% Shapiro Wilk Critical Value			0.874	Data appear Lognormal at 5% Significance Level														
548	Lilliefors Test Statistic			0.159	Lilliefors Lognormal GOF Test														
549	5% Lilliefors Critical Value			0.226	Data appear Lognormal at 5% Significance Level														
550	Data appear Lognormal at 5% Significance Level																		
551	Lognormal Statistics																		
552	Minimum of Logged Data			2.252	Mean of logged Data			2.593											
553	Maximum of Logged Data			2.986	SD of logged Data			0.209											
554	Assuming Lognormal Distribution																		
555	95% H-UCL			15.19	90% Chebyshev (MVUE) UCL			15.94											
556	95% Chebyshev (MVUE) UCL			16.98	97.5% Chebyshev (MVUE) UCL			18.42											
557	99% Chebyshev (MVUE) UCL			21.26															
558	Nonparametric Distribution Free UCL Statistics																		
559	Data appear to follow a Discernible Distribution at 5% Significance Level																		
560	Nonparametric Distribution Free UCLs																		
561	95% CLT UCL			14.9	95% Jackknife UCL			15											
562	95% Standard Bootstrap UCL			14.82	95% Bootstrap-t UCL			15.09											
563	95% Hall's Bootstrap UCL			15.44	95% Percentile Bootstrap UCL			14.94											
564	95% BCA Bootstrap UCL			14.9															
565	90% Chebyshev(Mean, Sd) UCL			15.93	95% Chebyshev(Mean, Sd) UCL			16.97											
566	97.5% Chebyshev(Mean, Sd) UCL			18.41	99% Chebyshev(Mean, Sd) UCL			21.24											
567	Suggested UCL to Use																		
568	95% Student's-t UCL			15															
569																			

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
570							Zinc					
General Statistics												
572	Total Number of Observations			14			Number of Distinct Observations		14			
573							Number of Missing Observations		0			
574			Minimum	15.6					Mean	85.81		
575			Maximum	545					Median	48.15		
576			SD	134.8					Std. Error of Mean	36.03		
577			Coefficient of Variation	1.571					Skewness	3.502		
578	Normal GOF Test											
579	Shapiro Wilk Test Statistic			0.464			Shapiro Wilk GOF Test					
580	5% Shapiro Wilk Critical Value			0.874			Data Not Normal at 5% Significance Level					
581	Lilliefors Test Statistic			0.378			Lilliefors GOF Test					
582	5% Lilliefors Critical Value			0.226			Data Not Normal at 5% Significance Level					
583	Data Not Normal at 5% Significance Level											
584	Assuming Normal Distribution											
585	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
586	95% Student's-t UCL			149.6			95% Adjusted-CLT UCL (Chen-1995)		181.1			
587							95% Modified-t UCL (Johnson-1978)		155.2			
588	Gamma GOF Test											
589	A-D Test Statistic			1.541			Anderson-Darling Gamma GOF Test					
590	5% A-D Critical Value			0.757			Data Not Gamma Distributed at 5% Significance Level					
591	K-S Test Statistic			0.305			Kolmogorov-Smirnov Gamma GOF Test					
592	5% K-S Critical Value			0.234			Data Not Gamma Distributed at 5% Significance Level					
593	Data Not Gamma Distributed at 5% Significance Level											
594	Gamma Statistics											
595	k hat (MLE)			1.183			k star (bias corrected MLE)		0.977			
596	Theta hat (MLE)			72.52			Theta star (bias corrected MLE)		87.8			
597	nu hat (MLE)			33.13			nu star (bias corrected)		27.36			
598	MLE Mean (bias corrected)			85.81			MLE Sd (bias corrected)		86.8			
599							Approximate Chi Square Value (0.05)		16.43			
600	Adjusted Level of Significance			0.0312			Adjusted Chi Square Value		15.32			
601	Assuming Gamma Distribution											
602	95% Approximate Gamma UCL (use when n>=50)			142.9			95% Adjusted Gamma UCL (use when n<50)		153.3			
603	Lognormal GOF Test											
604	Shapiro Wilk Test Statistic			0.866			Shapiro Wilk Lognormal GOF Test					
605	5% Shapiro Wilk Critical Value			0.874			Data Not Lognormal at 5% Significance Level					
606	Lilliefors Test Statistic			0.228			Lilliefors Lognormal GOF Test					
607	5% Lilliefors Critical Value			0.226			Data Not Lognormal at 5% Significance Level					
608	Data Not Lognormal at 5% Significance Level											
609	Lognormal Statistics											
610	Minimum of Logged Data			2.747			Mean of logged Data		3.973			
611	Maximum of Logged Data			6.301			SD of logged Data		0.842			
612	Assuming Lognormal Distribution											
613	95% H-UCL			137.1			90% Chebyshev (MVUE) UCL		126.2			
614	95% Chebyshev (MVUE) UCL			150.1			97.5% Chebyshev (MVUE) UCL		183.3			
615	99% Chebyshev (MVUE) UCL			248.6								
616	Nonparametric Distribution Free UCL Statistics											
617	Data do not follow a Discernible Distribution (0.05)											
618	Nonparametric Distribution Free UCLs											
619	95% CLT UCL			145.1			95% Jackknife UCL		149.6			
620	95% Standard Bootstrap UCL			142.4			95% Bootstrap-t UCL		439.7			
621	95% Hall's Bootstrap UCL			422.8			95% Percentile Bootstrap UCL		155.5			
622	95% BCA Bootstrap UCL			195.1								
623	90% Chebyshev(Mean, Sd) UCL			193.9			95% Chebyshev(Mean, Sd) UCL		242.9			
624	97.5% Chebyshev(Mean, Sd) UCL			310.8			99% Chebyshev(Mean, Sd) UCL		444.3			
625	Suggested UCL to Use											
626	95% Chebyshev (Mean, Sd) UCL			242.9								
627												

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
628							Mercury					
629							General Statistics					
630				Total Number of Observations	14			Number of Distinct Observations	14			
631								Number of Missing Observations	0			
632				Minimum	0.0056					Mean	0.0457	
633				Maximum	0.25					Median	0.0222	
634				SD	0.0671			Std. Error of Mean	0.0179			
635				Coefficient of Variation	1.468					Skewness	2.654	
636						Normal GOF Test						
637				Shapiro Wilk Test Statistic	0.581		Shapiro Wilk GOF Test					
638				5% Shapiro Wilk Critical Value	0.874		Data Not Normal at 5% Significance Level					
639				Lilliefors Test Statistic	0.394		Lilliefors GOF Test					
640				5% Lilliefors Critical Value	0.226		Data Not Normal at 5% Significance Level					
641						Data Not Normal at 5% Significance Level						
642						Assuming Normal Distribution						
643						95% Normal UCL		95% UCLs (Adjusted for Skewness)				
644						95% Student's-t UCL	0.0775	95% Adjusted-CLT UCL (Chen-1995)	0.0888			
645								95% Modified-t UCL (Johnson-1978)	0.0796			
646							Gamma GOF Test					
647						A-D Test Statistic	1.31	Anderson-Darling Gamma GOF Test				
648						5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level				
649						K-S Test Statistic	0.333	Kolmogorov-Smirnov Gamma GOF Test				
650						5% K-S Critical Value	0.235	Data Not Gamma Distributed at 5% Significance Level				
651							Data Not Gamma Distributed at 5% Significance Level					
652							Gamma Statistics					
653						k hat (MLE)	0.975	k star (bias corrected MLE)	0.814			
654						Theta hat (MLE)	0.0469	Theta star (bias corrected MLE)	0.0562			
655						nu hat (MLE)	27.31	nu star (bias corrected)	22.79			
656						MLE Mean (bias corrected)	0.0457	MLE Sd (bias corrected)	0.0507			
657								Approximate Chi Square Value (0.05)	12.93			
658						Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	11.96			
659							Assuming Gamma Distribution					
660						95% Approximate Gamma UCL (use when n>=50)	0.0806	95% Adjusted Gamma UCL (use when n<50)	0.0871			
661							Lognormal GOF Test					
662						Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Lognormal GOF Test				
663						5% Shapiro Wilk Critical Value	0.874	Data appear Lognormal at 5% Significance Level				
664						Lilliefors Test Statistic	0.257	Lilliefors Lognormal GOF Test				
665						5% Lilliefors Critical Value	0.226	Data Not Lognormal at 5% Significance Level				
666							Data appear Approximate Lognormal at 5% Significance Level					
667							Lognormal Statistics					
668						Minimum of Logged Data	-5.185	Mean of logged Data	-3.679			
669						Maximum of Logged Data	-1.386	SD of logged Data	1.017			
670							Assuming Lognormal Distribution					
671						95% H-UCL	0.0939	90% Chebyshev (MVUE) UCL	0.076			
672						95% Chebyshev (MVUE) UCL	0.0921	97.5% Chebyshev (MVUE) UCL	0.115			
673						99% Chebyshev (MVUE) UCL	0.159					
674							Nonparametric Distribution Free UCL Statistics					
675							Data appear to follow a Discernible Distribution at 5% Significance Level					
676							Nonparametric Distribution Free UCLs					
677						95% CLT UCL	0.0752	95% Jackknife UCL	0.0775			
678						95% Standard Bootstrap UCL	0.0733	95% Bootstrap-t UCL	0.186			
679						95% Hall's Bootstrap UCL	0.193	95% Percentile Bootstrap UCL	0.0764			
680						95% BCA Bootstrap UCL	0.0927					
681						90% Chebyshev(Mean, Sd) UCL	0.0995	95% Chebyshev(Mean, Sd) UCL	0.124			
682						97.5% Chebyshev(Mean, Sd) UCL	0.158	99% Chebyshev(Mean, Sd) UCL	0.224			
683							Suggested UCL to Use					
684						95% Chebyshev (Mean, Sd) UCL	0.124					
685												

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
686																			
TOTAL PAHS																			
General Statistics																			
688			Total Number of Observations	13					Number of Distinct Observations	13									
689									Number of Missing Observations	1									
690			Minimum	0.0657					Mean	0.426									
691			Maximum	1.87					Median	0.276									
692			SD	0.468					Std. Error of Mean	0.13									
693			Coefficient of Variation	1.099					Skewness	2.773									
694			Normal GOF Test																
695			Shapiro Wilk Test Statistic	0.66					Shapiro Wilk GOF Test										
696			5% Shapiro Wilk Critical Value	0.866					Data Not Normal at 5% Significance Level										
697			Lilliefors Test Statistic	0.27					Lilliefors GOF Test										
698			5% Lilliefors Critical Value	0.234					Data Not Normal at 5% Significance Level										
699			Data Not Normal at 5% Significance Level																
700			Assuming Normal Distribution																
701			95% Normal UCL			95% UCLs (Adjusted for Skewness)													
702			95% Student's-t UCL	0.657		95% Adjusted-CLT UCL (Chen-1995)	0.746												
703						95% Modified-t UCL (Johnson-1978)	0.674												
704			Gamma GOF Test																
705			A-D Test Statistic	0.438		Anderson-Darling Gamma GOF Test													
706			5% A-D Critical Value	0.75		Detected data appear Gamma Distributed at 5% Significance Level													
707			K-S Test Statistic	0.161		Kolmogorov-Smirnov Gamma GOF Test													
708			5% K-S Critical Value	0.241		Detected data appear Gamma Distributed at 5% Significance Level													
709			Detected data appear Gamma Distributed at 5% Significance Level																
710			Gamma Statistics																
711			k hat (MLE)	1.492					k star (bias corrected MLE)	1.199									
712			Theta hat (MLE)	0.285					Theta star (bias corrected MLE)	0.355									
713			nu hat (MLE)	38.79					nu star (bias corrected)	31.17									
714			MLE Mean (bias corrected)	0.426					MLE Sd (bias corrected)	0.389									
715									Approximate Chi Square Value (0.05)	19.42									
716			Adjusted Level of Significance	0.0301					Adjusted Chi Square Value	18.1									
717			Assuming Gamma Distribution																
718			95% Approximate Gamma UCL (use when n>=50)	0.684					95% Adjusted Gamma UCL (use when n<50)	0.733									
719			Lognormal GOF Test																
720			Shapiro Wilk Test Statistic	0.978		Shapiro Wilk Lognormal GOF Test													
721			5% Shapiro Wilk Critical Value	0.866		Data appear Lognormal at 5% Significance Level													
722			Lilliefors Test Statistic	0.122		Lilliefors Lognormal GOF Test													
723			5% Lilliefors Critical Value	0.234		Data appear Lognormal at 5% Significance Level													
724			Data appear Lognormal at 5% Significance Level																
725			Lognormal Statistics																
726			Minimum of Logged Data	-2.723					Mean of logged Data	-1.225									
727			Maximum of Logged Data	0.626					SD of logged Data	0.863									
728			Assuming Lognormal Distribution																
729			95% H-UCL	0.818					90% Chebyshev (MVUE) UCL	0.725									
730			95% Chebyshev (MVUE) UCL	0.867					97.5% Chebyshev (MVUE) UCL	1.064									
731			99% Chebyshev (MVUE) UCL	1.452															
732			Nonparametric Distribution Free UCL Statistics																
733			Data appear to follow a Discernible Distribution at 5% Significance Level																
734			Nonparametric Distribution Free UCLs																
735			95% CLT UCL	0.639					95% Jackknife UCL	0.657									
736			95% Standard Bootstrap UCL	0.627					95% Bootstrap-t UCL	0.934									
737			95% Hall's Bootstrap UCL	1.451					95% Percentile Bootstrap UCL	0.643									
738			95% BCA Bootstrap UCL	0.779															
739			90% Chebyshev(Mean, Sd) UCL	0.815					95% Chebyshev(Mean, Sd) UCL	0.992									
740			97.5% Chebyshev(Mean, Sd) UCL	1.237					99% Chebyshev(Mean, Sd) UCL	1.718									
741			Suggested UCL to Use																
742			95% Adjusted Gamma UCL	0.733															
743																			

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
UCL Statistics for Data Sets with Non-Detects												
744												
745 User Selected Options												
746 Date/Time of Computation					ProUCL 5.112/26/2017 7:26:17 PM							
747 From File					171222 Sediment UCLs.xls							
748 Full Precision					OFF							
749 Confidence Coefficient					95%							
750 Number of Bootstrap Operations					2000							
751												
Selenium												
752												
753 General Statistics												
754 Total Number of Observations					14				Number of Distinct Observations			14
755 Number of Detects					12				Number of Non-Detects			2
756 Number of Distinct Detects					12				Number of Distinct Non-Detects			2
757 Minimum Detect					0.289				Minimum Non-Detect			0.234
758 Maximum Detect					0.757				Maximum Non-Detect			0.32
759 Variance Detects					0.0231				Percent Non-Detects			14.29%
760 Mean Detects					0.466				SD Detects			0.152
761 Median Detects					0.45				CV Detects			0.326
762 Skewness Detects					0.51				Kurtosis Detects			-0.769
763 Mean of Logged Detects					-0.812				SD of Logged Detects			0.325
Normal GOF Test on Detects Only												
764												
765 Shapiro Wilk Test Statistic					0.93				Shapiro Wilk GOF Test			
766 5% Shapiro Wilk Critical Value					0.859				Detected Data appear Normal at 5% Significance Level			
767 Lilliefors Test Statistic					0.171				Lilliefors GOF Test			
768 5% Lilliefors Critical Value					0.243				Detected Data appear Normal at 5% Significance Level			
769												
Detected Data appear Normal at 5% Significance Level												
770												
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
771 KM Mean					0.436				KM Standard Error of Mean			0.0432
772 KM SD					0.154				95% KM (BCA) UCL			0.499
773 95% KM (t) UCL					0.512				95% KM (Percentile Bootstrap) UCL			0.507
774 95% KM (z) UCL					0.507				95% KM Bootstrap t UCL			0.521
775 90% KM Chebyshev UCL					0.565				95% KM Chebyshev UCL			0.624
776 97.5% KM Chebyshev UCL					0.705				99% KM Chebyshev UCL			0.865
777												
Gamma GOF Tests on Detected Observations Only												
778												
778 A-D Test Statistic					0.338				Anderson-Darling GOF Test			
779 5% A-D Critical Value					0.73				Detected data appear Gamma Distributed at 5% Significance Level			
780 K-S Test Statistic					0.151				Kolmogorov-Smirnov GOF			
781 5% K-S Critical Value					0.245				Detected data appear Gamma Distributed at 5% Significance Level			
782												
Detected data appear Gamma Distributed at 5% Significance Level												
783												
Gamma Statistics on Detected Data Only												
784 k hat (MLE)					10.48				k star (bias corrected MLE)			7.915
785 Theta hat (MLE)					0.0445				Theta star (bias corrected MLE)			0.0589
786 nu hat (MLE)					251.5				nu star (bias corrected)			190
787 Mean (detects)					0.466							
788												
Gamma ROS Statistics using Imputed Non-Detects												
789												
789 GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
790												
790 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)												
791												
791 For such situations, GROS method may yield incorrect values of UCLs and BTVs												
792												
792 This is especially true when the sample size is small.												
793												
793 For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
794 Minimum					0.152				Mean			0.427
795 Maximum					0.757				Median			0.385
796 SD					0.172				CV			0.403
797 k hat (MLE)					6.177				k star (bias corrected MLE)			4.901
798 Theta hat (MLE)					0.0692				Theta star (bias corrected MLE)			0.0872
799 nu hat (MLE)					173				nu star (bias corrected)			137.2
800 Adjusted Level of Significance (β)					0.0312							
801 Approximate Chi Square Value (137.22, α)					111.2				Adjusted Chi Square Value (137.22, β)			108
802 95% Gamma Approximate UCL (use when n>=50)					0.528				95% Gamma Adjusted UCL (use when n<50)			0.543
803												
Estimates of Gamma Parameters using KM Estimates												
804												
804 Mean (KM)					0.436				SD (KM)			0.154

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L					
805				Variance (KM)	0.0239					SE of Mean (KM)	0.0432						
806				k hat (KM)	7.953					k star (KM)	6.297						
807				nu hat (KM)	222.7					nu star (KM)	176.3						
808				theta hat (KM)	0.0548					theta star (KM)	0.0692						
809				80% gamma percentile (KM)	0.571					90% gamma percentile (KM)	0.668						
810				95% gamma percentile (KM)	0.755					99% gamma percentile (KM)	0.937						
811				Gamma Kaplan-Meier (KM) Statistics													
812				Approximate Chi Square Value (176.31, α)	146.6			Adjusted Chi Square Value (176.31, β)	143								
813				95% Gamma Approximate KM-UCL (use when n>=50)	0.524			95% Gamma Adjusted KM-UCL (use when n<50)	0.537								
814				Lognormal GOF Test on Detected Observations Only													
815				Shapiro Wilk Test Statistic	0.94			Shapiro Wilk GOF Test									
816				5% Shapiro Wilk Critical Value	0.859			Detected Data appear Lognormal at 5% Significance Level									
817				Lilliefors Test Statistic	0.144			Lilliefors GOF Test									
818				5% Lilliefors Critical Value	0.243			Detected Data appear Lognormal at 5% Significance Level									
819				Detected Data appear Lognormal at 5% Significance Level													
820				Lognormal ROS Statistics Using Imputed Non-Detects													
821				Mean in Original Scale	0.432			Mean in Log Scale	-0.908								
822				SD in Original Scale	0.165			SD in Log Scale	0.389								
823				95% t UCL (assumes normality of ROS data)	0.51			95% Percentile Bootstrap UCL	0.502								
824				95% BCA Bootstrap UCL	0.51			95% Bootstrap t UCL	0.52								
825				95% H-UCL (Log ROS)	0.539												
826				Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution													
827				KM Mean (logged)	-0.893			KM Geo Mean	0.409								
828				KM SD (logged)	0.353			95% Critical H Value (KM-Log)	1.94								
829				KM Standard Error of Mean (logged)	0.0988			95% H-UCL (KM -Log)	0.527								
830				KM SD (logged)	0.353			95% Critical H Value (KM-Log)	1.94								
831				KM Standard Error of Mean (logged)	0.0988												
832				DL/2 Statistics													
833				DL/2 Normal				DL/2 Log-Transformed									
834				Mean in Original Scale	0.419			Mean in Log Scale	-0.98								
835				SD in Original Scale	0.184			SD in Log Scale	0.526								
836				95% t UCL (Assumes normality)	0.506			95% H-Stat UCL	0.58								
837				DL/2 is not a recommended method, provided for comparisons and historical reasons													
838				Nonparametric Distribution Free UCL Statistics													
839				Detected Data appear Normal Distributed at 5% Significance Level													
840				Suggested UCL to Use													
841				95% KM (t) UCL	0.512												
842																	

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L						
843							Thallium											
844							General Statistics											
845				Total Number of Observations	14			Number of Distinct Observations	14									
846				Number of Detects	10			Number of Non-Detects	4									
847				Number of Distinct Detects	10			Number of Distinct Non-Detects	4									
848				Minimum Detect	0.0952			Minimum Non-Detect	0.079									
849				Maximum Detect	0.288			Maximum Non-Detect	0.093									
850				Variance Detects	0.00475			Percent Non-Detects	28.57%									
851				Mean Detects	0.182			SD Detects	0.0689									
852				Median Detects	0.172			CV Detects	0.379									
853				Skewness Detects	0.278			Kurtosis Detects	-1.501									
854				Mean of Logged Detects	-1.772			SD of Logged Detects	0.393									
855				Normal GOF Test on Detects Only														
856				Shapiro Wilk Test Statistic	0.921			Shapiro Wilk GOF Test										
857				5% Shapiro Wilk Critical Value	0.842			Detected Data appear Normal at 5% Significance Level										
858				Lilliefors Test Statistic	0.228			Lilliefors GOF Test										
859				5% Lilliefors Critical Value	0.262			Detected Data appear Normal at 5% Significance Level										
860				Detected Data appear Normal at 5% Significance Level														
861				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs														
862				KM Mean	0.152			KM Standard Error of Mean	0.0203									
863				KM SD	0.0722			95% KM (BCA) UCL	0.187									
864				95% KM (t) UCL	0.188			95% KM (Percentile Bootstrap) UCL	0.187									
865				95% KM (z) UCL	0.186			95% KM Bootstrap t UCL	0.193									
866				90% KM Chebyshev UCL	0.213			95% KM Chebyshev UCL	0.241									
867				97.5% KM Chebyshev UCL	0.279			99% KM Chebyshev UCL	0.355									
868				Gamma GOF Tests on Detected Observations Only														
869				A-D Test Statistic	0.38			Anderson-Darling GOF Test										
870				5% A-D Critical Value	0.727			Detected data appear Gamma Distributed at 5% Significance Level										
871				K-S Test Statistic	0.214			Kolmogorov-Smirnov GOF										
872				5% K-S Critical Value	0.267			Detected data appear Gamma Distributed at 5% Significance Level										
873				Detected data appear Gamma Distributed at 5% Significance Level														
874				Gamma Statistics on Detected Data Only														
875				k hat (MLE)	7.545			k star (bias corrected MLE)	5.348									
876				Theta hat (MLE)	0.0241			Theta star (bias corrected MLE)	0.034									
877				nu hat (MLE)	150.9			nu star (bias corrected)	107									
878				Mean (detects)	0.182													
879				Gamma ROS Statistics using Imputed Non-Detects														
880				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs														
881				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)														
882				For such situations, GROS method may yield incorrect values of UCLs and BTVs														
883				This is especially true when the sample size is small.														
884				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates														
885				Minimum	0.0427			Mean	0.142									
886				Maximum	0.288			Median	0.133									
887				SD	0.0868			CV	0.611									
888				k hat (MLE)	2.473			k star (bias corrected MLE)	1.991									
889				Theta hat (MLE)	0.0574			Theta star (bias corrected MLE)	0.0714									
890				nu hat (MLE)	69.26			nu star (bias corrected)	55.75									
891				Adjusted Level of Significance (β)	0.0312													
892				Approximate Chi Square Value (55.75, α)	39.59			Adjusted Chi Square Value (55.75, β)	37.79									
893				95% Gamma Approximate UCL (use when n>=50)	0.2			95% Gamma Adjusted UCL (use when n<50)	0.21									
894				Estimates of Gamma Parameters using KM Estimates														
895				Mean (KM)	0.152			SD (KM)	0.0722									
896				Variance (KM)	0.00521			SE of Mean (KM)	0.0203									
897				k hat (KM)	4.459			k star (KM)	3.551									
898				nu hat (KM)	124.8			nu star (KM)	99.43									
899				theta hat (KM)	0.0342			theta star (KM)	0.0429									
900				80% gamma percentile (KM)	0.213			90% gamma percentile (KM)	0.261									
901				95% gamma percentile (KM)	0.305			99% gamma percentile (KM)	0.4									
902				Gamma Kaplan-Meier (KM) Statistics														
903				Approximate Chi Square Value (99.43, α)	77.42			Adjusted Chi Square Value (99.43, β)	74.85									

Sediment 95% UCL Calculations
East Ditch South
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L						
904		95% Gamma Approximate KM-UCL (use when n>=50)			0.196		95% Gamma Adjusted KM-UCL (use when n<50)			0.202								
Lognormal GOF Test on Detected Observations Only																		
906		Shapiro Wilk Test Statistic		0.93			Shapiro Wilk GOF Test											
907		5% Shapiro Wilk Critical Value		0.842			Detected Data appear Lognormal at 5% Significance Level											
908		Lilliefors Test Statistic		0.189			Lilliefors GOF Test											
909		5% Lilliefors Critical Value		0.262			Detected Data appear Lognormal at 5% Significance Level											
910	Detected Data appear Lognormal at 5% Significance Level																	
911	Lognormal ROS Statistics Using Imputed Non-Detects																	
912	Mean in Original Scale		0.149				Mean in Log Scale		-2.042									
913	SD in Original Scale		0.0789				SD in Log Scale		0.55									
914	95% t UCL (assumes normality of ROS data)		0.186				95% Percentile Bootstrap UCL		0.182									
915	95% BCA Bootstrap UCL		0.186				95% Bootstrap t UCL		0.194									
916	95% H-UCL (Log ROS)		0.207															
917	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																	
918	KM Mean (logged)		-1.991				KM Geo Mean		0.137									
919	KM SD (logged)		0.468				95% Critical H Value (KM-Log)		2.007									
920	KM Standard Error of Mean (logged)		0.132				95% H-UCL (KM -Log)		0.198									
921	KM SD (logged)		0.468				95% Critical H Value (KM-Log)		2.007									
922	KM Standard Error of Mean (logged)		0.132															
923	DL/2 Statistics																	
924	DL/2 Normal						DL/2 Log-Transformed											
925	Mean in Original Scale		0.142				Mean in Log Scale		-2.159									
926	SD in Original Scale		0.0864				SD in Log Scale		0.714									
927	95% t UCL (Assumes normality)		0.183				95% H-Stat UCL		0.238									
928	DL/2 is not a recommended method, provided for comparisons and historical reasons																	
929	Nonparametric Distribution Free UCL Statistics																	
930	Detected Data appear Normal Distributed at 5% Significance Level																	
931	Suggested UCL to Use																	
932	95% KM (t) UCL		0.188															

Sediment Analytical Data Summary
East Ditch North (Marine)
Brine Service Company Superfund Site

Sample Location	Depth Interval	Barium	Beryllium	Lead	Manganese	Selenium	D_Selenium	Vanadium	Zinc	Mercury	LMWPAHs	HMWPAHs	TPAHs	Thallium	D_Thallium	Cyanide	D_Cyanide	ES	D_ES	BEP	D_BEP	Carbazole	D_Carbazole	Heptachlor	Heptachlor
EDDSD01	0-0.5 ft	3940	0.344	37.4	404	0.955	1	11.8	250	0.178	0.340	0.284	0.917	0.12	0	1.10	0	0.011	0	0.13	0	4.20E-02	0	0.00570	0
EDDSD02	0-0.5 ft	4730	0.368	38.0	319	0.597	1	12.8	192	0.104	0.339	0.453	1.091	0.12	0	1.10	0	0.011	0	0.13	0	4.20E-02	0	0.00570	0
EDDSD03	0-0.5 ft	1070	0.393	31.1	130	0.534	1	11.8	197	0.505	0.0706	0.293	0.5497	0.11	0	1.10	0	0.0038	1	0.098	1	7.50E-03	1	0.00054	0
EDDSD04	0-0.5 ft	1440	0.261	44.4	234	0.427	1	8.15	364	0.259	0.275	0.784	1.509	0.097	0	1.75	1	0.0093	0	0.13	1	3.40E-02	0	0.00460	0
EDDSD05	0-0.5 ft	2960	0.269	26.3	230	0.508	1	12.4	171	0.078	0.356	0.321	0.983	0.167	1	1.20	0	0.012	0	0.13	0	4.40E-02	0	0.00600	0
EDDSD05	0-0.5 ft	3190	0.303	25.0	255	0.524	1	11.1	193	0.133	0.404	0.392	1.143	0.1	0	3.03	1	0.014	0	0.15	0	5.00E-02	0	0.00680	0
EDDSD06	0-0.5 ft	696	0.227	33.6	1230	1.12	1	11.8	239	0.258	0.421	1.214	2.331	0.096	0	0.93	0	0.0094	0	0.10	0	4.30E-02	1	0.00470	0
EDDSD07	0-0.5 ft	278	0.170	14.5	951	0.30	0	9.24	55.3	0.084	3.347	18.670	28.247	0.084	0	0.78	0	0.0079	0	0.087	0	3.50E-01	1	0.011	1
EDDSD08	0-0.5 ft	206	0.371	9.7	441	0.441	1	10.7	35.2	0.0154	0.0624	0.411	0.6973	0.297	1	1.28	1	0.0091	0	0.028	1	3.40E-03	0	0.023	1
EDDSD09	0-0.5 ft	367	0.293	23.1	474	0.392	1	11.0	198	0.105	5.605	40.100	60.94	0.094	0	0.91	0	0.0092	0	0.10	0	7.70E-01	1	0.00460	0
EDDSD10	0-0.5 ft	395	0.269	24.7	722	0.802	1	9.79	124	0.097	0.2186	3.210	4.993	0.124	1	0.95	0	0.0096	0	0.22	1	2.60E-02	1	0.00480	0
EDDSD07	0-0.5 ft	572	0.211	19.4	1220	0.650	1	11.8	119	0.154	2.078	0.330	3.49	0.13	0			0.012	0	1.6	1	3.50E-02	1	0.00580	0
EDDSD09	0-0.5 ft	2020	0.331	52.8	2590	0.968	1	13.4	342	0.144	2.107	0.330	3.47	0.197	1			0.023	1	0.17	1	3.40E-02	1	0.00630	0
EDNSS01	0-0.5 ft	368	0.300	225	148	0.651	1	11.0	111	0.0288	0.2049	0.324	0.6899	0.089	1	0.673	1	0.0063	0	0.069	0	2.30E-02	0	0.00320	0
EDNSS02	0-0.5 ft	484	0.541	64.4	2530	1.23	1	12.8	408	0.212	0.0879	0.164	0.4941	0.21	1	0.93	0	0.0094	0	0.026	1	3.50E-03	0	0.00470	0
EDNSS03	0-0.5 ft	837	0.411	133	131	0.900	1	13.7	347	0.358	0.1014	0.436	0.7635	0.103	1	0.94	0	0.0095	0	0.023	1	1.10E-02	1	0.00480	0
EDNSS03	0-0.5 ft	698	0.374	85.8	163	0.693	1	12.4	211	0.234	0.0739	0.318	0.6102	0.11	0	0.96	0	0.0097	0	0.11	1	2.30E-02	1	0.00490	0
EDNSS04	0-0.5 ft	355	0.339	32.9	199	0.779	1	10.8	105	0.183	0.0294	0.070	0.1517	0.0825	1	0.76	0	0.0039	0	0.022	1	3.90E-03	1	0.00190	0
EDNSS05	0-0.5 ft	456	0.440	32.0	160	0.718	1	11.9	81.4	0.0642	0.0355	0.095	0.1914	0.111	1	0.90	0	0.0046	0	0.024	1	4.00E-03	1	0.00230	0
EDNSS06	0-0.5 ft	615	0.444	19.6	180	0.647	1	11.6	126	0.0913	0.0389	0.121	0.227	0.119	1	0.88	0	0.0045	0	0.083	1	3.30E-03	1	0.00220	0
EDNSS07	0-0.5 ft	3740	0.488	30.8	291	1.03	1	11.9	185	0.400	0.0397	0.074	0.1569	0.161	1	1.20	0	0.0060	0	0.039	1	4.40E-03	0	0.00300	0
EDNSS08	0-0.5 ft	3650	0.479	57.0	223	1.390	1	14.1	353	0.533	0.0451	0.172	0.331	0.126	1	1.00	0	0.001	0	0.066	1	4.60E-03	1	0.00051	0

Max	4730	0.541	225	2590	1.39		14.1	408	0.533	5.61	40.1	60.9	0.297		3.03		0.023		1.60		0.770		0.023	
Min	206	0.170	9.68	130	0.300		8.15	35.2	0.0154	0.0294	0.0695	0.152	0.0825		0.673		0.0010		0.022		0.0033		0.00051	
Average	1503	0.347	48.2	601	0.739		11.6	200	0.192	0.740	3.12	5.18	0.131		1.12		0.0089		0.161		0.0710		0.0053	
Count	22	22	22	22	22		22	22	22	22	22	22	22		20		22	22	22		22		22	

**Sediment 95% UCL Calculations
East Ditch North
Brine Service Company Superfund Site**

	A	B	C	D	E	F	G	H	I	J	K	L	
1													
					UCL Statistics for Uncensored Full Data Sets								
2			User Selected Options										
3			Date/Time of Computation		ProUCL 5.112/26/2017 11:15:22 PM								
4			From File		171222 Sediment UCLs_a.xls								
5			Full Precision		OFF								
6			Confidence Coefficient		95%								
7			Number of Bootstrap Operations		2000								
8													

Sediment 95% UCL Calculations
East Ditch North
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L							
9	Barium																		
10	General Statistics																		
11																			
12	Total Number of Observations		22			Number of Distinct Observations		22											
13						Number of Missing Observations		0											
14	Minimum		206					Mean	1503										
15	Maximum		4730					Median	697										
16	SD		1468					Std. Error of Mean	312.9										
17	Coefficient of Variation		0.976					Skewness	1.031										
18	Normal GOF Test																		
19	Shapiro Wilk Test Statistic		0.789			Shapiro Wilk GOF Test													
20	5% Shapiro Wilk Critical Value		0.911			Data Not Normal at 5% Significance Level													
21	Lilliefors Test Statistic		0.266			Lilliefors GOF Test													
22	5% Lilliefors Critical Value		0.184			Data Not Normal at 5% Significance Level													
23	Data Not Normal at 5% Significance Level																		
24	Assuming Normal Distribution																		
25	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
26	95% Student's-t UCL		2041			95% Adjusted-CLT UCL (Chen-1995)		2091											
27						95% Modified-t UCL (Johnson-1978)		2053											
28	Gamma GOF Test																		
29	A-D Test Statistic		1.169			Anderson-Darling Gamma GOF Test													
30	5% A-D Critical Value		0.766			Data Not Gamma Distributed at 5% Significance Level													
31	K-S Test Statistic		0.21			Kolmogorov-Smirnov Gamma GOF Test													
32	5% K-S Critical Value		0.19			Data Not Gamma Distributed at 5% Significance Level													
33	Gamma Statistics																		
34	k hat (MLE)		1.204			k star (bias corrected MLE)		1.071											
35	Theta hat (MLE)		1248			Theta star (bias corrected MLE)		1404											
36	nu hat (MLE)		53			nu star (bias corrected)		47.1											
37	MLE Mean (bias corrected)		1503			MLE Sd (bias corrected)		1453											
38						Approximate Chi Square Value (0.05)		32.35											
39	Adjusted Level of Significance		0.0386			Adjusted Chi Square Value		31.44											
40	Assuming Gamma Distribution																		
41	95% Approximate Gamma UCL (use when n>=50)		2188			95% Adjusted Gamma UCL (use when n<50)		2252											
42	Lognormal GOF Test																		
43	Shapiro Wilk Test Statistic		0.912			Shapiro Wilk Lognormal GOF Test													
44	5% Shapiro Wilk Critical Value		0.911			Data appear Lognormal at 5% Significance Level													
45	Lilliefors Test Statistic		0.163			Lilliefors Lognormal GOF Test													
46	5% Lilliefors Critical Value		0.184			Data appear Lognormal at 5% Significance Level													
47	Data appear Lognormal at 5% Significance Level																		
48	Lognormal Statistics																		
49	Minimum of Logged Data		5.328			Mean of logged Data		6.846											
50	Maximum of Logged Data		8.462			SD of logged Data		0.996											
51	Assuming Lognormal Distribution																		
52	95% H-UCL		2704			90% Chebyshev (MVUE) UCL		2568											
53	95% Chebyshev (MVUE) UCL		3054			97.5% Chebyshev (MVUE) UCL		3729											
54	99% Chebyshev (MVUE) UCL		5054																
55	Nonparametric Distribution Free UCL Statistics																		
56	Data appear to follow a Discernible Distribution at 5% Significance Level																		
57	Nonparametric Distribution Free UCLs																		
58	95% CLT UCL		2018			95% Jackknife UCL		2041											
59	95% Standard Bootstrap UCL		2005			95% Bootstrap-t UCL		2193											
60	95% Hall's Bootstrap UCL		2040			95% Percentile Bootstrap UCL		2012											
61	95% BCA Bootstrap UCL		2061																
62	90% Chebyshev(Mean, Sd) UCL		2442			95% Chebyshev(Mean, Sd) UCL		2867											
63	97.5% Chebyshev(Mean, Sd) UCL		3457			99% Chebyshev(Mean, Sd) UCL		4616											
64	Suggested UCL to Use																		
65	95% H-UCL		2704																
66	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.																		
67	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.																		
68	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.																		
69	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.																		
70																			

Sediment 95% UCL Calculations
East Ditch North
Brine Service Company Superfund Site

	A	B	C	D	E	F	G	H	I	J	K	L
71	Lead											
72	General Statistics											
73												
74												
75	Total Number of Observations		22				Number of Distinct Observations		22			
76								Number of Missing Observations		0		
77	Minimum		9.68					Mean		48.2		
78	Maximum		225					Median		32.45		
79	SD		47.92					Std. Error of Mean		10.22		
80	Coefficient of Variation		0.994					Skewness		2.844		
81	Normal GOF Test											
82	Shapiro Wilk Test Statistic		0.647				Shapiro Wilk GOF Test					
83	5% Shapiro Wilk Critical Value		0.911				Data Not Normal at 5% Significance Level					
84	Lilliefors Test Statistic		0.266				Lilliefors GOF Test					
85	5% Lilliefors Critical Value		0.184				Data Not Normal at 5% Significance Level					
86	Assuming Normal Distribution											
87	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
88	95% Student's-t UCL		65.79				95% Adjusted-CLT UCL (Chen-1995)		71.63			
89							95% Modified-t UCL (Johnson-1978)		66.82			
90	Gamma GOF Test											
91	A-D Test Statistic		1.057				Anderson-Darling Gamma GOF Test					
92	5% A-D Critical Value		0.757				Data Not Gamma Distributed at 5% Significance Level					
93	K-S Test Statistic		0.21				Kolmogorov-Smirnov Gamma GOF Test					
94	5% K-S Critical Value		0.188				Data Not Gamma Distributed at 5% Significance Level					
95	Gamma Statistics											
96	k hat (MLE)		1.92				k star (bias corrected MLE)		1.688			
97	Theta hat (MLE)		25.11				Theta star (bias corrected MLE)		28.55			
98	nu hat (MLE)		84.47				nu star (bias corrected)		74.28			
99	MLE Mean (bias corrected)		48.2				MLE Sd (bias corrected)		37.1			
100							Approximate Chi Square Value (0.05)		55.43			
101	Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		54.22			
102	Assuming Gamma Distribution											
103	95% Approximate Gamma UCL (use when n>=50)		64.59				95% Adjusted Gamma UCL (use when n<50)		66.04			
104	Lognormal GOF Test											
105	Shapiro Wilk Test Statistic		0.951				Shapiro Wilk Lognormal GOF Test					
106	5% Shapiro Wilk Critical Value		0.911				Data appear Lognormal at 5% Significance Level					
107	Lilliefors Test Statistic		0.157				Lilliefors Lognormal GOF Test					
108	5% Lilliefors Critical Value		0.184				Data appear Lognormal at 5% Significance Level					
109	Data appear Lognormal at 5% Significance Level											
110	Lognormal Statistics											
111	Minimum of Logged Data		2.27				Mean of logged Data		3.593			
112	Maximum of Logged Data		5.416				SD of logged Data		0.707			
113	Assuming Lognormal Distribution											
114	95% H-UCL		65.66				90% Chebyshev (MVUE) UCL		68.37			
115	95% Chebyshev (MVUE) UCL		78.48				97.5% Chebyshev (MVUE) UCL		92.52			
116	99% Chebyshev (MVUE) UCL		120.1									
117	Nonparametric Distribution Free UCL Statistics											
118	Data appear to follow a Discernible Distribution at 5% Significance Level											
119	Nonparametric Distribution Free UCLs											
120	95% CLT UCL		65.01				95% Jackknife UCL		65.79			
121	95% Standard Bootstrap UCL		64.56				95% Bootstrap-t UCL		83.59			
122	95% Hall's Bootstrap UCL		140.3				95% Percentile Bootstrap UCL		66.95			
123	95% BCA Bootstrap UCL		71.21									
124	90% Chebyshev(Mean, Sd) UCL		78.86				95% Chebyshev(Mean, Sd) UCL		92.74			
125	97.5% Chebyshev(Mean, Sd) UCL		112				99% Chebyshev(Mean, Sd) UCL		149.9			
126	Suggested UCL to Use											
127	95% H-UCL		65.66									
128	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
129	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
130	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
131	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
132												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
133	Low Molecular Weight PAHs											
134	General Statistics											
135		Total Number of Observations	22			Number of Distinct Observations	22					
136						Number of Missing Observations	0					
137		Minimum	0.0294			Mean	0.74					
138		Maximum	5.605			Median	0.212					
139		SD	1.384			Std. Error of Mean	0.295					
140		Coefficient of Variation	1.87			Skewness	2.647					
141	Normal GOF Test											
142		Shapiro Wilk Test Statistic	0.564			Shapiro Wilk GOF Test						
143		5% Shapiro Wilk Critical Value	0.911			Data Not Normal at 5% Significance Level						
144		Lilliefors Test Statistic	0.409			Lilliefors GOF Test						
145		5% Lilliefors Critical Value	0.184			Data Not Normal at 5% Significance Level						
146	Data Not Normal at 5% Significance Level											
147	Assuming Normal Distribution											
148	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
149		95% Student's-t UCL	1.248			95% Adjusted-CLT UCL (Chen-1995)	1.403					
150						95% Modified-t UCL (Johnson-1978)	1.276					
151	Gamma GOF Test											
152		A-D Test Statistic	1.609			Anderson-Darling Gamma GOF Test						
153		5% A-D Critical Value	0.804			Data Not Gamma Distributed at 5% Significance Level						
154		K-S Test Statistic	0.271			Kolmogorov-Smirnov Gamma GOF Test						
155		5% K-S Critical Value	0.196			Data Not Gamma Distributed at 5% Significance Level						
156	Data Not Gamma Distributed at 5% Significance Level											
157	Gamma Statistics											
158		k hat (MLE)	0.507			k star (bias corrected MLE)	0.468					
159		Theta hat (MLE)	1.46			Theta star (bias corrected MLE)	1.581					
160		nu hat (MLE)	22.3			nu star (bias corrected)	20.59					
161		MLE Mean (bias corrected)	0.74			MLE Sd (bias corrected)	1.082					
162						Approximate Chi Square Value (0.05)	11.29					
163		Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	10.77					
164	Assuming Gamma Distribution											
165	95% Approximate Gamma UCL (use when n>=50))	1.35			95% Adjusted Gamma UCL (use when n<50)	1.414						
166	Lognormal GOF Test											
167		Shapiro Wilk Test Statistic	0.915			Shapiro Wilk Lognormal GOF Test						
168		5% Shapiro Wilk Critical Value	0.911			Data appear Lognormal at 5% Significance Level						
169		Lilliefors Test Statistic	0.148			Lilliefors Lognormal GOF Test						
170		5% Lilliefors Critical Value	0.184			Data appear Lognormal at 5% Significance Level						
171	Data appear Lognormal at 5% Significance Level											
172	Lognormal Statistics											
173		Minimum of Logged Data	-3.527			Mean of logged Data	-1.552					
174		Maximum of Logged Data	1.724			SD of logged Data	1.555					
175	Assuming Lognormal Distribution											
176		95% H-UCL	2.276			90% Chebyshev (MVUE) UCL	1.413					
177		95% Chebyshev (MVUE) UCL	1.763			97.5% Chebyshev (MVUE) UCL	2.25					
178		99% Chebyshev (MVUE) UCL	3.207									
179	Nonparametric Distribution Free UCL Statistics											
180	Data appear to follow a Discernible Distribution at 5% Significance Level											
181	Nonparametric Distribution Free UCLs											
182		95% CLT UCL	1.225			95% Jackknife UCL	1.248					
183		95% Standard Bootstrap UCL	1.222			95% Bootstrap-t UCL	1.673					
184		95% Hall's Bootstrap UCL	1.546			95% Percentile Bootstrap UCL	1.261					
185		95% BCA Bootstrap UCL	1.456									
186		90% Chebyshev(Mean, Sd) UCL	1.625			95% Chebyshev(Mean, Sd) UCL	2.026					
187		97.5% Chebyshev(Mean, Sd) UCL	2.583			99% Chebyshev(Mean, Sd) UCL	3.676					
188	Suggested UCL to Use											
189		95% Chebyshev (Mean, Sd) UCL	2.026									
190												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L		
191	High Molecular Weight PAHs													
192	General Statistics													
193		Total Number of Observations	22			Number of Distinct Observations	21							
194						Number of Missing Observations	0							
195		Minimum	0.0695					Mean	3.117					
196		Maximum	40.1					Median	0.327					
197		SD	9.146					Std. Error of Mean	1.95					
198		Coefficient of Variation	2.935					Skewness	3.692					
199	Normal GOF Test													
200		Shapiro Wilk Test Statistic	0.369			Shapiro Wilk GOF Test								
201		5% Shapiro Wilk Critical Value	0.911			Data Not Normal at 5% Significance Level								
202		Lilliefors Test Statistic	0.446			Lilliefors GOF Test								
203		5% Lilliefors Critical Value	0.184			Data Not Normal at 5% Significance Level								
204	Data Not Normal at 5% Significance Level													
205	Assuming Normal Distribution													
206	95% Normal UCL				95% UCLs (Adjusted for Skewness)									
207		95% Student's-t UCL	6.472			95% Adjusted-CLT UCL (Chen-1995)	7.964							
208						95% Modified-t UCL (Johnson-1978)	6.728							
209	Gamma GOF Test													
210		A-D Test Statistic	3.782			Anderson-Darling Gamma GOF Test								
211		5% A-D Critical Value	0.837			Data Not Gamma Distributed at 5% Significance Level								
212		K-S Test Statistic	0.383			Kolmogorov-Smirnov Gamma GOF Test								
213		5% K-S Critical Value	0.2			Data Not Gamma Distributed at 5% Significance Level								
214	Data Not Gamma Distributed at 5% Significance Level													
215	Gamma Statistics													
216		k hat (MLE)	0.351			k star (bias corrected MLE)	0.333							
217		Theta hat (MLE)	8.882			Theta star (bias corrected MLE)	9.349							
218		nu hat (MLE)	15.44			nu star (bias corrected)	14.67							
219		MLE Mean (bias corrected)	3.117			MLE Sd (bias corrected)	5.398							
220						Approximate Chi Square Value (0.05)	7.031							
221		Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	6.638							
222	Assuming Gamma Distribution													
223		95% Approximate Gamma UCL (use when n>=50)	6.502			95% Adjusted Gamma UCL (use when n<50)	6.886							
224	Lognormal GOF Test													
225		Shapiro Wilk Test Statistic	0.814			Shapiro Wilk Lognormal GOF Test								
226		5% Shapiro Wilk Critical Value	0.911			Data Not Lognormal at 5% Significance Level								
227		Lilliefors Test Statistic	0.276			Lilliefors Lognormal GOF Test								
228		5% Lilliefors Critical Value	0.184			Data Not Lognormal at 5% Significance Level								
229	Data Not Lognormal at 5% Significance Level													
230	Lognormal Statistics													
231		Minimum of Logged Data	-2.666			Mean of logged Data	-0.779							
232		Maximum of Logged Data	3.691			SD of logged Data	1.588							
233	Assuming Lognormal Distribution													
234		95% H-UCL	5.426			90% Chebyshev (MVUE) UCL	3.246							
235		95% Chebyshev (MVUE) UCL	4.061			97.5% Chebyshev (MVUE) UCL	5.192							
236		99% Chebyshev (MVUE) UCL	7.414											
237	Nonparametric Distribution Free UCL Statistics													
238	Data do not follow a Discernible Distribution (0.05)													
239	Nonparametric Distribution Free UCLs													
240		95% CLT UCL	6.324			95% Jackknife UCL	6.472							
241		95% Standard Bootstrap UCL	6.252			95% Bootstrap-t UCL	41.01							
242		95% Hall's Bootstrap UCL	41.81			95% Percentile Bootstrap UCL	6.624							
243		95% BCA Bootstrap UCL	8.682											
244		90% Chebyshev(Mean, Sd) UCL	8.967			95% Chebyshev(Mean, Sd) UCL	11.62							
245		97.5% Chebyshev(Mean, Sd) UCL	15.29			99% Chebyshev(Mean, Sd) UCL	22.52							
246	Suggested UCL to Use													
247		95% Chebyshev (Mean, Sd) UCL	11.62											
248														

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L							
249	Total PAHs																		
250	General Statistics																		
251	Total Number of Observations			22	Number of Distinct Observations			22											
252					Number of Missing Observations			0											
253	Minimum			0.152					Mean										
254	Maximum			60.94					Median										
255	SD			13.78					Std. Error of Mean										
256	Coefficient of Variation			2.659					Skewness										
257	Normal GOF Test																		
258	Shapiro Wilk Test Statistic			0.396	Shapiro Wilk GOF Test														
259	5% Shapiro Wilk Critical Value			0.911					Data Not Normal at 5% Significance Level										
260	Lilliefors Test Statistic			0.415	Lilliefors GOF Test														
261	5% Lilliefors Critical Value			0.184					Data Not Normal at 5% Significance Level										
262	Data Not Normal at 5% Significance Level																		
263	Assuming Normal Distribution																		
264	95% Normal UCL				95% UCLs (Adjusted for Skewness)														
265	95% Student's-t UCL			10.23					95% Adjusted-CLT UCL (Chen-1995)										
266									95% Modified-t UCL (Johnson-1978)										
267	Gamma GOF Test																		
268	A-D Test Statistic			2.542	Anderson-Darling Gamma GOF Test														
269	5% A-D Critical Value			0.821					Data Not Gamma Distributed at 5% Significance Level										
270	K-S Test Statistic			0.278	Kolmogorov-Smirnov Gamma GOF Test														
271	5% K-S Critical Value			0.198					Data Not Gamma Distributed at 5% Significance Level										
272	Data Not Gamma Distributed at 5% Significance Level																		
273	Gamma Statistics																		
274	k hat (MLE)			0.422					k star (bias corrected MLE)										
275	Theta hat (MLE)			12.29					Theta star (bias corrected MLE)										
276	nu hat (MLE)			18.55					nu star (bias corrected)										
277	MLE Mean (bias corrected)			5.181					MLE Sd (bias corrected)										
278									Approximate Chi Square Value (0.05)										
279	Adjusted Level of Significance			0.0386					Adjusted Chi Square Value										
280	Assuming Gamma Distribution																		
281	95% Approximate Gamma UCL (use when n>=50)			10.07					95% Adjusted Gamma UCL (use when n<50)										
282	Lognormal GOF Test																		
283	Shapiro Wilk Test Statistic			0.906	Shapiro Wilk Lognormal GOF Test														
284	5% Shapiro Wilk Critical Value			0.911					Data Not Lognormal at 5% Significance Level										
285	Lilliefors Test Statistic			0.172	Lilliefors Lognormal GOF Test														
286	5% Lilliefors Critical Value			0.184					Data appear Lognormal at 5% Significance Level										
287	Data appear Approximate Lognormal at 5% Significance Level																		
288	Lognormal Statistics																		
289	Minimum of Logged Data			-1.886					Mean of logged Data										
290	Maximum of Logged Data			4.11					SD of logged Data										
291	Assuming Lognormal Distribution																		
292	95% H-UCL			10.97					90% Chebyshev (MVUE) UCL										
293	95% Chebyshev (MVUE) UCL			8.732					97.5% Chebyshev (MVUE) UCL										
294	99% Chebyshev (MVUE) UCL			15.83															
295	Nonparametric Distribution Free UCL Statistics																		
296	Data appear to follow a Discernible Distribution at 5% Significance Level																		
297	Nonparametric Distribution Free UCLs																		
298	95% CLT UCL			10.01					95% Jackknife UCL										
299	95% Standard Bootstrap UCL			9.94					95% Bootstrap-t UCL										
300	95% Hall's Bootstrap UCL			33.57					95% Percentile Bootstrap UCL										
301	95% BCA Bootstrap UCL			12.84															
302	90% Chebyshev(Mean, Sd) UCL			13.99					95% Chebyshev(Mean, Sd) UCL										
303	97.5% Chebyshev(Mean, Sd) UCL			23.52					99% Chebyshev(Mean, Sd) UCL										
304	Suggested UCL to Use																		
305	95% Chebyshev (Mean, Sd) UCL			17.98															
306																			

**Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L	
307					UCL Statistics for Data Sets with Non-Detects								
308		User Selected Options											
309		Date/Time of Computation			ProUCL 5.112/26/2017 11:36:05 PM								
310		From File			171222 Sediment UCLs_a.xls								
311		Full Precision			OFF								
312		Confidence Coefficient			95%								
313		Number of Bootstrap Operations			2000								

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L	
314													
315	bis(2-Ethylhexyl) phthalate												
316	General Statistics												
317	Total Number of Observations		22				Number of Distinct Observations		18				
318	Number of Detects		14				Number of Non-Detects		8				
319	Number of Distinct Detects		14				Number of Distinct Non-Detects		5				
320	Minimum Detect		0.022				Minimum Non-Detect		0.069				
321	Maximum Detect		1.6				Maximum Non-Detect		0.15				
322	Variance Detects		0.169				Percent Non-Detects		36.36%				
323	Mean Detects		0.189				SD Detects		0.411				
324	Median Detects		0.0745				CV Detects		2.18				
325	Skewness Detects		3.601				Kurtosis Detects		13.23				
326	Mean of Logged Detects		-2.599				SD of Logged Detects		1.192				
327	Normal GOF Test on Detects Only												
328	Shapiro Wilk Test Statistic		0.423				Shapiro Wilk GOF Test						
329	5% Shapiro Wilk Critical Value		0.874				Detected Data Not Normal at 5% Significance Level						
330	Lilliefors Test Statistic		0.398				Lilliefors GOF Test						
331	5% Lilliefors Critical Value		0.226				Detected Data Not Normal at 5% Significance Level						
332	Detected Data Not Normal at 5% Significance Level												
333	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
334	KM Mean		0.136				KM Standard Error of Mean		0.0718				
335	KM SD		0.324				95% KM (BCA) UCL		0.288				
336	95% KM (t) UCL		0.26				95% KM (Percentile Bootstrap) UCL		0.276				
337	95% KM (z) UCL		0.254				95% KM Bootstrap t UCL		0.724				
338	90% KM Chebyshev UCL		0.351				95% KM Chebyshev UCL		0.449				
339	97.5% KM Chebyshev UCL		0.584				99% KM Chebyshev UCL		0.85				
340	Gamma GOF Tests on Detected Observations Only												
341	A-D Test Statistic		1.409				Anderson-Darling GOF Test						
342	5% A-D Critical Value		0.779				Detected Data Not Gamma Distributed at 5% Significance Level						
343	K-S Test Statistic		0.229				Kolmogorov-Smirnov GOF						
344	5% K-S Critical Value		0.239				Detected data appear Gamma Distributed at 5% Significance Level						
345	Detected data follow Appr. Gamma Distribution at 5% Significance Level												
346	Gamma Statistics on Detected Data Only												
347	k hat (MLE)		0.656				k star (bias corrected MLE)		0.563				
348	Theta hat (MLE)		0.287				Theta star (bias corrected MLE)		0.335				
349	nu hat (MLE)		18.36				nu star (bias corrected)		15.76				
350	Mean (detects)		0.189										
351	Gamma ROS Statistics using Imputed Non-Detects												
352	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
353	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)												
354	For such situations, GROS method may yield incorrect values of UCLs and BTVs												
355	This is especially true when the sample size is small.												
356	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
357	Minimum		0.01				Mean		0.128				
358	Maximum		1.6				Median		0.027				
359	SD		0.334				CV		2.609				
360	k hat (MLE)		0.553				k star (bias corrected MLE)		0.508				
361	Theta hat (MLE)		0.231				Theta star (bias corrected MLE)		0.252				
362	nu hat (MLE)		24.34				nu star (bias corrected)		22.35				
363	Adjusted Level of Significance (β)		0.0386										
364	Approximate Chi Square Value (22.35, α)		12.6				Adjusted Chi Square Value (22.35, β)		12.06				
365	95% Gamma Approximate UCL (use when n>=50)		0.227				95% Gamma Adjusted UCL (use when n<50)		0.237				
366	Estimates of Gamma Parameters using KM Estimates												
367	Mean (KM)		0.136				SD (KM)		0.324				
368	Variance (KM)		0.105				SE of Mean (KM)		0.0718				
369	k hat (KM)		0.177				k star (KM)		0.183				
370	nu hat (KM)		7.779				nu star (KM)		8.051				
371	theta hat (KM)		0.77				theta star (KM)		0.744				
372	80% gamma percentile (KM)		0.171				90% gamma percentile (KM)		0.411				
373	95% gamma percentile (KM)		0.717				99% gamma percentile (KM)		1.574				
374	Gamma Kaplan-Meier (KM) Statistics												
375	Approximate Chi Square Value (8.05, α)		2.765				Adjusted Chi Square Value (8.05, β)		2.538				

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
376	95% Gamma Approximate KM-UCL (use when n>=50)		0.396			95% Gamma Adjusted KM-UCL (use when n<50)					0.432	
Lognormal GOF Test on Detected Observations Only												
Shapiro Wilk Test Statistic												
378	Shapiro Wilk Critical Value		0.873									Shapiro Wilk GOF Test
379	5% Shapiro Wilk Critical Value		0.874									Detected Data Not Lognormal at 5% Significance Level
380	Lilliefors Test Statistic		0.153									Lilliefors GOF Test
381	5% Lilliefors Critical Value		0.226									Detected Data appear Lognormal at 5% Significance Level
382	Detected Data appear Approximate Lognormal at 5% Significance Level											
383	Lognormal ROS Statistics Using Imputed Non-Detects											
384	Mean in Original Scale		0.136									Mean in Log Scale
385	SD in Original Scale		0.331									SD in Log Scale
386	95% t UCL (assumes normality of ROS data)		0.257									95% Percentile Bootstrap UCL
387	95% BCA Bootstrap UCL		0.347									95% Bootstrap t UCL
388	95% H-UCL (Log ROS)		0.176									
389	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
390	KM Mean (logged)		-2.848									KM Geo Mean
391	KM SD (logged)		1.03									95% Critical H Value (KM-Log)
392	KM Standard Error of Mean (logged)		0.246									95% H-UCL (KM -Log)
393	KM SD (logged)		1.03									95% Critical H Value (KM-Log)
394	KM Standard Error of Mean (logged)		0.246									
395	DL/2 Statistics											
396	DL/2 Normal				DL/2 Log-Transformed							
397	Mean in Original Scale		0.14									Mean in Log Scale
398	SD in Original Scale		0.33									SD in Log Scale
399	95% t UCL (Assumes normality)		0.261									95% H-Stat UCL
400	DL/2 is not a recommended method, provided for comparisons and historical reasons											
401	Nonparametric Distribution Free UCL Statistics											
402	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
403	Suggested UCL to Use											
404	Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)		0.432									
405	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
406	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											

Sediment 95% UCL Calculations
East Ditch North
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	A	B	C	D	E	F	G	H	I	J	K	L
407												
408	Selenium											
409	General Statistics											
410	Total Number of Observations	22				Number of Distinct Observations	22					
411	Number of Detects	21				Number of Non-Detects	1					
412	Number of Distinct Detects	21				Number of Distinct Non-Detects	1					
413	Minimum Detect	0.392				Minimum Non-Detect	0.3					
414	Maximum Detect	1.39				Maximum Non-Detect	0.3					
415	Variance Detects	0.0756				Percent Non-Detects	4.545%					
416	Mean Detects	0.76				SD Detects	0.275					
417	Median Detects	0.693				CV Detects	0.362					
418	Skewness Detects	0.723				Kurtosis Detects	-0.146					
419	Mean of Logged Detects	-0.335				SD of Logged Detects	0.356					
420	Normal GOF Test on Detects Only											
421	Shapiro Wilk Test Statistic	0.945				Shapiro Wilk GOF Test						
422	5% Shapiro Wilk Critical Value	0.908				Detected Data appear Normal at 5% Significance Level						
423	Lilliefors Test Statistic	0.132				Lilliefors GOF Test						
424	5% Lilliefors Critical Value	0.188				Detected Data appear Normal at 5% Significance Level						
425	Detected Data appear Normal at 5% Significance Level											
426	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
427	KM Mean	0.739				KM Standard Error of Mean	0.061					
428	KM SD	0.279				95% KM (BCA) UCL	0.846					
429	95% KM (t) UCL	0.844				95% KM (Percentile Bootstrap) UCL	0.836					
430	95% KM (z) UCL	0.839				95% KM Bootstrap t UCL	0.857					
431	90% KM Chebyshev UCL	0.922				95% KM Chebyshev UCL	1.005					
432	97.5% KM Chebyshev UCL	1.12				99% KM Chebyshev UCL	1.345					
433	Gamma GOF Tests on Detected Observations Only											
434	A-D Test Statistic	0.215				Anderson-Darling GOF Test						
435	5% A-D Critical Value	0.743				Detected data appear Gamma Distributed at 5% Significance Level						
436	K-S Test Statistic	0.102				Kolmogorov-Smirnov GOF						
437	5% K-S Critical Value	0.19				Detected data appear Gamma Distributed at 5% Significance Level						
438	Detected data appear Gamma Distributed at 5% Significance Level											
439	Gamma Statistics on Detected Data Only											
440	k hat (MLE)	8.411				k star (bias corrected MLE)	7.241					
441	Theta hat (MLE)	0.0903				Theta star (bias corrected MLE)	0.105					
442	nu hat (MLE)	353.3				nu star (bias corrected)	304.1					
443	Mean (detects)	0.76										
444	Gamma ROS Statistics using Imputed Non-Detects											
445	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
446	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
447	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
448	This is especially true when the sample size is small.											
449	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
450	Minimum	0.215				Mean	0.735					
451	Maximum	1.39				Median	0.672					
452	SD	0.292				CV	0.398					
453	k hat (MLE)	6.255				k star (bias corrected MLE)	5.433					
454	Theta hat (MLE)	0.118				Theta star (bias corrected MLE)	0.135					
455	nu hat (MLE)	275.2				nu star (bias corrected)	239					
456	Adjusted Level of Significance (β)	0.0386										
457	Approximate Chi Square Value (239.04, α)	204.2				Adjusted Chi Square Value (239.04, β)	201.8					
458	95% Gamma Approximate UCL (use when n>=50)	0.86				95% Gamma Adjusted UCL (use when n<50)	0.87					
459	Estimates of Gamma Parameters using KM Estimates											
460	Mean (KM)	0.739				SD (KM)	0.279					
461	Variance (KM)	0.0779				SE of Mean (KM)	0.061					
462	k hat (KM)	7.012				k star (KM)	6.086					
463	nu hat (KM)	308.5				nu star (KM)	267.8					
464	theta hat (KM)	0.105				theta star (KM)	0.121					
465	80% gamma percentile (KM)	0.972				90% gamma percentile (KM)	1.139					
466	95% gamma percentile (KM)	1.29				99% gamma percentile (KM)	1.607					
467	Gamma Kaplan-Meier (KM) Statistics											
468	Approximate Chi Square Value (267.78, α)	230.9				Adjusted Chi Square Value (267.78, β)	228.3					

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L	
469	95% Gamma Approximate KM-UCL (use when n>=50)				0.857		95% Gamma Adjusted KM-UCL (use when n<50)			0.867			
Lognormal GOF Test on Detected Observations Only													
Shapiro Wilk Test Statistic													
471	0.979						Shapiro Wilk GOF Test						
472	5% Shapiro Wilk Critical Value				0.908		Detected Data appear Lognormal at 5% Significance Level						
473	Lilliefors Test Statistic				0.0801		Lilliefors GOF Test						
474	5% Lilliefors Critical Value				0.188		Detected Data appear Lognormal at 5% Significance Level						
475	Detected Data appear Lognormal at 5% Significance Level												
476	Lognormal ROS Statistics Using Imputed Non-Detects												
477	Mean in Original Scale				0.739		Mean in Log Scale			-0.376			
478	SD in Original Scale				0.286		SD in Log Scale			0.396			
479	95% t UCL (assumes normality of ROS data)				0.844		95% Percentile Bootstrap UCL			0.836			
480	95% BCA Bootstrap UCL				0.846		95% Bootstrap t UCL			0.848			
481	95% H-UCL (Log ROS)				0.876								
482	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
483	KM Mean (logged)				-0.375		KM Geo Mean			0.687			
484	KM SD (logged)				0.385		95% Critical H Value (KM-Log)			1.9			
485	KM Standard Error of Mean (logged)				0.0841		95% H-UCL (KM -Log)			0.868			
486	KM SD (logged)				0.385		95% Critical H Value (KM-Log)			1.9			
487	KM Standard Error of Mean (logged)				0.0841								
488	DL/2 Statistics												
489	DL/2 Normal				DL/2 Log-Transformed								
490	Mean in Original Scale				0.732		Mean in Log Scale			-0.406			
491	SD in Original Scale				0.298		SD in Log Scale			0.482			
492	95% t UCL (Assumes normality)				0.841		95% H-Stat UCL			0.921			
493	DL/2 is not a recommended method, provided for comparisons and historical reasons												
494	Nonparametric Distribution Free UCL Statistics												
495	Detected Data appear Normal Distributed at 5% Significance Level												
496	Suggested UCL to Use												
497	95% KM (t) UCL				0.844								
498													

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
499	Beryllium											
500	General Statistics											
501	Total Number of Observations		22				Number of Distinct Observations		21			
502							Number of Missing Observations		0			
503	Minimum		0.17						Mean	0.347		
504	Maximum		0.541						Median	0.342		
505	SD		0.0957					Std. Error of Mean		0.0204		
506	Coefficient of Variation		0.276					Skewness		0.18		
507	Normal GOF Test											
508	Shapiro Wilk Test Statistic		0.988				Shapiro Wilk GOF Test					
509	5% Shapiro Wilk Critical Value		0.911				Data appear Normal at 5% Significance Level					
510	Lilliefors Test Statistic		0.085				Lilliefors GOF Test					
511	5% Lilliefors Critical Value		0.184				Data appear Normal at 5% Significance Level					
512	Data appear Normal at 5% Significance Level											
513	Assuming Normal Distribution											
514	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
515	95% Student's-t UCL		0.382				95% Adjusted-CLT UCL (Chen-1995)		0.381			
516							95% Modified-t UCL (Johnson-1978)		0.382			
517	Gamma GOF Test											
518	A-D Test Statistic		0.123				Anderson-Darling Gamma GOF Test					
519	5% A-D Critical Value		0.743				Detected data appear Gamma Distributed at 5% Significance Level					
520	K-S Test Statistic		0.0764				Kolmogorov-Smirnov Gamma GOF Test					
521	5% K-S Critical Value		0.185				Detected data appear Gamma Distributed at 5% Significance Level					
522	Detected data appear Gamma Distributed at 5% Significance Level											
523	Gamma Statistics											
524	k hat (MLE)		13.1				k star (bias corrected MLE)		11.35			
525	Theta hat (MLE)		0.0265				Theta star (bias corrected MLE)		0.0305			
526	nu hat (MLE)		576.6				nu star (bias corrected)		499.3			
527	MLE Mean (bias corrected)		0.347				MLE Sd (bias corrected)		0.103			
528							Approximate Chi Square Value (0.05)		448.5			
529	Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		444.9			
530	Assuming Gamma Distribution											
531	95% Approximate Gamma UCL (use when n>=50))		0.386				95% Adjusted Gamma UCL (use when n<50)		0.389			
532	Lognormal GOF Test											
533	Shapiro Wilk Test Statistic		0.979				Shapiro Wilk Lognormal GOF Test					
534	5% Shapiro Wilk Critical Value		0.911				Data appear Lognormal at 5% Significance Level					
535	Lilliefors Test Statistic		0.0871				Lilliefors Lognormal GOF Test					
536	5% Lilliefors Critical Value		0.184				Data appear Lognormal at 5% Significance Level					
537	Data appear Lognormal at 5% Significance Level											
538	Lognormal Statistics											
539	Minimum of Logged Data		-1.772				Mean of logged Data		-1.098			
540	Maximum of Logged Data		-0.614				SD of logged Data		0.291			
541	Assuming Lognormal Distribution											
542	95% H-UCL		0.391				90% Chebyshev (MVUE) UCL		0.413			
543	95% Chebyshev (MVUE) UCL		0.442				97.5% Chebyshev (MVUE) UCL		0.483			
544	99% Chebyshev (MVUE) UCL		0.564									
545	Nonparametric Distribution Free UCL Statistics											
546	Data appear to follow a Discernible Distribution at 5% Significance Level											
547	Nonparametric Distribution Free UCLs											
548	95% CLT UCL		0.38				95% Jackknife UCL		0.382			
549	95% Standard Bootstrap UCL		0.38				95% Bootstrap-t UCL		0.382			
550	95% Hall's Bootstrap UCL		0.382				95% Percentile Bootstrap UCL		0.379			
551	95% BCA Bootstrap UCL		0.38									
552	90% Chebyshev(Mean, Sd) UCL		0.408				95% Chebyshev(Mean, Sd) UCL		0.436			
553	97.5% Chebyshev(Mean, Sd) UCL		0.474				99% Chebyshev(Mean, Sd) UCL		0.55			
554	Suggested UCL to Use											
555	95% Student's-t UCL		0.382									
556												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
557	Manganese											
558	General Statistics											
559	Total Number of Observations		22			Number of Distinct Observations		22				
560						Number of Missing Observations		0				
561	Minimum	130					Mean	601.1				
562	Maximum	2590					Median	273				
563	SD	715.7					Std. Error of Mean	152.6				
564	Coefficient of Variation	1.191					Skewness	2.1				
565	Normal GOF Test											
566	Shapiro Wilk Test Statistic	0.664				Shapiro Wilk GOF Test						
567	5% Shapiro Wilk Critical Value	0.911				Data Not Normal at 5% Significance Level						
568	Lilliefors Test Statistic	0.298				Lilliefors GOF Test						
569	5% Lilliefors Critical Value	0.184				Data Not Normal at 5% Significance Level						
570	Data Not Normal at 5% Significance Level											
571	Assuming Normal Distribution											
572	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
573	95% Student's-t UCL	863.7				95% Adjusted-CLT UCL (Chen-1995)	925.1					
574						95% Modified-t UCL (Johnson-1978)	875.1					
575	Gamma GOF Test											
576	A-D Test Statistic	1.452				Anderson-Darling Gamma GOF Test						
577	5% A-D Critical Value	0.766				Data Not Gamma Distributed at 5% Significance Level						
578	K-S Test Statistic	0.21				Kolmogorov-Smirnov Gamma GOF Test						
579	5% K-S Critical Value	0.19				Data Not Gamma Distributed at 5% Significance Level						
580	Data Not Gamma Distributed at 5% Significance Level											
581	Gamma Statistics											
582	k hat (MLE)	1.188				k star (bias corrected MLE)	1.056					
583	Theta hat (MLE)	506.2				Theta star (bias corrected MLE)	569.3					
584	nu hat (MLE)	52.25				nu star (bias corrected)	46.46					
585	MLE Mean (bias corrected)	601.1				MLE Sd (bias corrected)	585					
586						Approximate Chi Square Value (0.05)	31.82					
587	Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	30.91					
588	Assuming Gamma Distribution											
589	95% Approximate Gamma UCL (use when n>=50)	877.7				95% Adjusted Gamma UCL (use when n<50)	903.4					
590	Lognormal GOF Test											
591	Shapiro Wilk Test Statistic	0.891				Shapiro Wilk Lognormal GOF Test						
592	5% Shapiro Wilk Critical Value	0.911				Data Not Lognormal at 5% Significance Level						
593	Lilliefors Test Statistic	0.16				Lilliefors Lognormal GOF Test						
594	5% Lilliefors Critical Value	0.184				Data appear Lognormal at 5% Significance Level						
595	Data appear Approximate Lognormal at 5% Significance Level											
596	Lognormal Statistics											
597	Minimum of Logged Data	4.868				Mean of logged Data	5.922					
598	Maximum of Logged Data	7.859				SD of logged Data	0.925					
599	Assuming Lognormal Distribution											
600	95% H-UCL	945.3				90% Chebyshev (MVUE) UCL	924.9					
601	95% Chebyshev (MVUE) UCL	1091				97.5% Chebyshev (MVUE) UCL	1322					
602	99% Chebyshev (MVUE) UCL	1776										
603	Nonparametric Distribution Free UCL Statistics											
604	Data appear to follow a Discernible Distribution at 5% Significance Level											
605	Nonparametric Distribution Free UCLs											
606	95% CLT UCL	852.1				95% Jackknife UCL	863.7					
607	95% Standard Bootstrap UCL	849.2				95% Bootstrap-t UCL	1018					
608	95% Hall's Bootstrap UCL	1126				95% Percentile Bootstrap UCL	862.8					
609	95% BCA Bootstrap UCL	933.6										
610	90% Chebyshev(Mean, Sd) UCL	1059				95% Chebyshev(Mean, Sd) UCL	1266					
611	97.5% Chebyshev(Mean, Sd) UCL	1554				99% Chebyshev(Mean, Sd) UCL	2119					
612	Suggested UCL to Use											
613	95% H-UCL	945.3										
614	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
615	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
616	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
617	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
618												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
619	Vanadium											
620	General Statistics											
621	Total Number of Observations		22				Number of Distinct Observations		15			
622							Number of Missing Observations		0			
623	Minimum		8.15				Mean		11.64			
624	Maximum		14.1				Median		11.8			
625	SD		1.406				Std. Error of Mean		0.3			
626	Coefficient of Variation		0.121				Skewness		-0.585			
627	Normal GOF Test											
628	Shapiro Wilk Test Statistic		0.961				Shapiro Wilk GOF Test					
629	5% Shapiro Wilk Critical Value		0.911				Data appear Normal at 5% Significance Level					
630	Lilliefors Test Statistic		0.137				Lilliefors GOF Test					
631	5% Lilliefors Critical Value		0.184				Data appear Normal at 5% Significance Level					
632	Data appear Normal at 5% Significance Level											
633	Assuming Normal Distribution											
634	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
635	95% Student's-t UCL		12.15				95% Adjusted-CLT UCL (Chen-1995)		12.09			
636							95% Modified-t UCL (Johnson-1978)		12.15			
637	Gamma GOF Test											
638	A-D Test Statistic		0.483				Anderson-Darling Gamma GOF Test					
639	5% A-D Critical Value		0.742				Detected data appear Gamma Distributed at 5% Significance Level					
640	K-S Test Statistic		0.153				Kolmogorov-Smirnov Gamma GOF Test					
641	5% K-S Critical Value		0.185				Detected data appear Gamma Distributed at 5% Significance Level					
642	Detected data appear Gamma Distributed at 5% Significance Level											
643	Gamma Statistics											
644	k hat (MLE)		67.15				k star (bias corrected MLE)		58.02			
645	Theta hat (MLE)		0.173				Theta star (bias corrected MLE)		0.201			
646	nu hat (MLE)		2955				nu star (bias corrected)		2553			
647	MLE Mean (bias corrected)		11.64				MLE Sd (bias corrected)		1.527			
648							Approximate Chi Square Value (0.05)		2437			
649	Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		2428			
650	Assuming Gamma Distribution											
651	95% Approximate Gamma UCL (use when n>=50)		12.19				95% Adjusted Gamma UCL (use when n<50)		12.23			
652	Lognormal GOF Test											
653	Shapiro Wilk Test Statistic		0.931				Shapiro Wilk Lognormal GOF Test					
654	5% Shapiro Wilk Critical Value		0.911				Data appear Lognormal at 5% Significance Level					
655	Lilliefors Test Statistic		0.158				Lilliefors Lognormal GOF Test					
656	5% Lilliefors Critical Value		0.184				Data appear Lognormal at 5% Significance Level					
657	Data appear Lognormal at 5% Significance Level											
658	Lognormal Statistics											
659	Minimum of Logged Data		2.098				Mean of logged Data		2.447			
660	Maximum of Logged Data		2.646				SD of logged Data		0.127			
661	Assuming Lognormal Distribution											
662	95% H-UCL		12.22				90% Chebyshev (MVUE) UCL		12.59			
663	95% Chebyshev (MVUE) UCL		13.02				97.5% Chebyshev (MVUE) UCL		13.62			
664	99% Chebyshev (MVUE) UCL		14.79									
665	Nonparametric Distribution Free UCL Statistics											
666	Data appear to follow a Discernible Distribution at 5% Significance Level											
667	Nonparametric Distribution Free UCLs											
668	95% CLT UCL		12.13				95% Jackknife UCL		12.15			
669	95% Standard Bootstrap UCL		12.11				95% Bootstrap-t UCL		12.13			
670	95% Hall's Bootstrap UCL		12.12				95% Percentile Bootstrap UCL		12.12			
671	95% BCA Bootstrap UCL		12.09									
672	90% Chebyshev(Mean, Sd) UCL		12.54				95% Chebyshev(Mean, Sd) UCL		12.94			
673	97.5% Chebyshev(Mean, Sd) UCL		13.51				99% Chebyshev(Mean, Sd) UCL		14.62			
674	Suggested UCL to Use											
675	95% Student's-t UCL		12.15									
676	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.											
677												
678												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
679	Zinc											
680	General Statistics											
681	Total Number of Observations		22				Number of Distinct Observations		22			
682							Number of Missing Observations		0			
683	Minimum		35.2				Mean		200.3			
684	Maximum		408				Median		192.5			
685	SD		106.4				Std. Error of Mean		22.68			
686	Coefficient of Variation		0.531				Skewness		0.472			
687	Normal GOF Test											
688	Shapiro Wilk Test Statistic		0.939				Shapiro Wilk GOF Test					
689	5% Shapiro Wilk Critical Value		0.911				Data appear Normal at 5% Significance Level					
690	Lilliefors Test Statistic		0.145				Lilliefors GOF Test					
691	5% Lilliefors Critical Value		0.184				Data appear Normal at 5% Significance Level					
692	Data appear Normal at 5% Significance Level											
693	Assuming Normal Distribution											
694	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
695	95% Student's-t UCL		239.3				95% Adjusted-CLT UCL (Chen-1995)		240.1			
696							95% Modified-t UCL (Johnson-1978)		239.7			
697	Gamma GOF Test											
698	A-D Test Statistic		0.327				Anderson-Darling Gamma GOF Test					
699	5% A-D Critical Value		0.749				Detected data appear Gamma Distributed at 5% Significance Level					
700	K-S Test Statistic		0.119				Kolmogorov-Smirnov Gamma GOF Test					
701	5% K-S Critical Value		0.187				Detected data appear Gamma Distributed at 5% Significance Level					
702	Detected data appear Gamma Distributed at 5% Significance Level											
703	Gamma Statistics											
704	k hat (MLE)		3.245				k star (bias corrected MLE)		2.833			
705	Theta hat (MLE)		61.73				Theta star (bias corrected MLE)		70.72			
706	nu hat (MLE)		142.8				nu star (bias corrected)		124.6			
707	MLE Mean (bias corrected)		200.3				MLE Sd (bias corrected)		119			
708							Approximate Chi Square Value (0.05)		99.85			
709	Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		98.2			
710	Assuming Gamma Distribution											
711	95% Approximate Gamma UCL (use when n>=50)		250				95% Adjusted Gamma UCL (use when n<50)		254.2			
712	Lognormal GOF Test											
713	Shapiro Wilk Test Statistic		0.939				Shapiro Wilk Lognormal GOF Test					
714	5% Shapiro Wilk Critical Value		0.911				Data appear Lognormal at 5% Significance Level					
715	Lilliefors Test Statistic		0.143				Lilliefors Lognormal GOF Test					
716	5% Lilliefors Critical Value		0.184				Data appear Lognormal at 5% Significance Level					
717	Data appear Lognormal at 5% Significance Level											
718	Lognormal Statistics											
719	Minimum of Logged Data		3.561				Mean of logged Data		5.138			
720	Maximum of Logged Data		6.011				SD of logged Data		0.628			
721	Assuming Lognormal Distribution											
722	95% H-UCL		277.7				90% Chebyshev (MVUE) UCL		292.7			
723	95% Chebyshev (MVUE) UCL		332.3				97.5% Chebyshev (MVUE) UCL		387.2			
724	99% Chebyshev (MVUE) UCL		495									
725	Nonparametric Distribution Free UCL Statistics											
726	Data appear to follow a Discernible Distribution at 5% Significance Level											
727	Nonparametric Distribution Free UCLs											
728	95% CLT UCL		237.6				95% Jackknife UCL		239.3			
729	95% Standard Bootstrap UCL		236.3				95% Bootstrap-t UCL		241.1			
730	95% Hall's Bootstrap UCL		240.4				95% Percentile Bootstrap UCL		238.7			
731	95% BCA Bootstrap UCL		239.4									
732	90% Chebyshev(Mean, Sd) UCL		268.3				95% Chebyshev(Mean, Sd) UCL		299.2			
733	97.5% Chebyshev(Mean, Sd) UCL		341.9				99% Chebyshev(Mean, Sd) UCL		426			
734	Suggested UCL to Use											
735	95% Student's-t UCL		239.3									
736												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
737	Mercury											
738	General Statistics											
739	Total Number of Observations 22 Number of Distinct Observations 22 Number of Missing Observations 0											
740	Minimum 0.0154 Mean 0.192 Maximum 0.533 Median 0.149 SD 0.144 Std. Error of Mean 0.0308 Coefficient of Variation 0.752 Skewness 1.163											
745	Normal GOF Test											
746	Shapiro Wilk Test Statistic 0.882 Shapiro Wilk GOF Test 5% Shapiro Wilk Critical Value 0.911 Data Not Normal at 5% Significance Level											
747	Lilliefors Test Statistic 0.161 Lilliefors GOF Test 5% Lilliefors Critical Value 0.184 Data appear Normal at 5% Significance Level											
749	Data appear Approximate Normal at 5% Significance Level											
750	Assuming Normal Distribution											
751	95% Normal UCL 95% Student's-t UCL 0.245 95% UCLs (Adjusted for Skewness) 95% Adjusted-CLT UCL (Chen-1995) 0.25 95% Modified-t UCL (Johnson-1978) 0.246											
755	Gamma GOF Test											
756	A-D Test Statistic 0.196 Anderson-Darling Gamma GOF Test 5% A-D Critical Value 0.757 Detected data appear Gamma Distributed at 5% Significance Level											
758	K-S Test Statistic 0.0922 Kolmogorov-Smirnov Gamma GOF Test 5% K-S Critical Value 0.188 Detected data appear Gamma Distributed at 5% Significance Level											
760	Detected data appear Gamma Distributed at 5% Significance Level											
761	Gamma Statistics											
762	k hat (MLE) 1.81 k star (bias corrected MLE) 1.594 Theta hat (MLE) 0.106 Theta star (bias corrected MLE) 0.12 nu hat (MLE) 79.65 nu star (bias corrected) 70.12 MLE Mean (bias corrected) 0.192 MLE Sd (bias corrected) 0.152											
766	Approximate Chi Square Value (0.05) 51.84											
767	Adjusted Level of Significance 0.0386 Adjusted Chi Square Value 50.67											
768	Assuming Gamma Distribution											
769	95% Approximate Gamma UCL (use when n>=50) 0.259 95% Adjusted Gamma UCL (use when n<50) 0.265											
770	Lognormal GOF Test											
771	Shapiro Wilk Test Statistic 0.954 Shapiro Wilk Lognormal GOF Test 5% Shapiro Wilk Critical Value 0.911 Data appear Lognormal at 5% Significance Level											
773	Lilliefors Test Statistic 0.111 Lilliefors Lognormal GOF Test 5% Lilliefors Critical Value 0.184 Data appear Lognormal at 5% Significance Level											
775	Data appear Lognormal at 5% Significance Level											
776	Lognormal Statistics											
777	Minimum of Logged Data -4.173 Mean of logged Data -1.952 Maximum of Logged Data -0.629 SD of logged Data 0.868											
779	Assuming Lognormal Distribution											
780	95% H-UCL 0.326 90% Chebyshev (MVUE) UCL 0.326											
781	95% Chebyshev (MVUE) UCL 0.382 97.5% Chebyshev (MVUE) UCL 0.46											
782	99% Chebyshev (MVUE) UCL 0.612											
783	Nonparametric Distribution Free UCL Statistics											
784	Data appear to follow a Discernible Distribution at 5% Significance Level											
785	Nonparametric Distribution Free UCLs											
786	95% CLT UCL 0.242 95% Jackknife UCL 0.245 95% Standard Bootstrap UCL 0.243 95% Bootstrap-t UCL 0.258											
788	95% Hall's Bootstrap UCL 0.253 95% Percentile Bootstrap UCL 0.243											
789	95% BCA Bootstrap UCL 0.247											
790	90% Chebyshev(Mean, Sd) UCL 0.284 95% Chebyshev(Mean, Sd) UCL 0.326											
791	97.5% Chebyshev(Mean, Sd) UCL 0.384 99% Chebyshev(Mean, Sd) UCL 0.498											
792	Suggested UCL to Use											
793	95% Student's-t UCL 0.245											
794	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
795	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
796												

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L
797	Thallium											
798	General Statistics											
799	Total Number of Observations	22										Number of Distinct Observations
800	Number of Detects	12										Number of Non-Detects
801	Number of Distinct Detects	12										Number of Distinct Non-Detects
802	Minimum Detect	0.0825										Minimum Non-Detect
803	Maximum Detect	0.297										Maximum Non-Detect
804	Variance Detects	0.00382										Percent Non-Detects
805	Mean Detects	0.149										SD Detects
806	Median Detects	0.125										CV Detects
807	Skewness Detects	1.334										Kurtosis Detects
808	Mean of Logged Detects	-1.974										SD of Logged Detects
809	Normal GOF Test on Detects Only											
810	Shapiro Wilk Test Statistic	0.882										Shapiro Wilk GOF Test
811	5% Shapiro Wilk Critical Value	0.859										Detected Data appear Normal at 5% Significance Level
812	Lilliefors Test Statistic	0.228										Lilliefors GOF Test
813	5% Lilliefors Critical Value	0.243										Detected Data appear Normal at 5% Significance Level
814	Detected Data appear Normal at 5% Significance Level											
815	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
816	KM Mean	0.122										KM Standard Error of Mean
817	KM SD	0.0534										95% KM (BCA) UCL
818	95% KM (t) UCL	0.142										95% KM (Percentile Bootstrap) UCL
819	95% KM (z) UCL	0.141										95% KM Bootstrap t UCL
820	90% KM Chebyshev UCL	0.158										95% KM Chebyshev UCL
821	97.5% KM Chebyshev UCL	0.197										99% KM Chebyshev UCL
822	Gamma GOF Tests on Detected Observations Only											
823	A-D Test Statistic	0.328										Anderson-Darling GOF Test
824	5% A-D Critical Value	0.731										Detected data appear Gamma Distributed at 5% Significance Level
825	K-S Test Statistic	0.208										Kolmogorov-Smirnov GOF
826	5% K-S Critical Value	0.246										Detected data appear Gamma Distributed at 5% Significance Level
827	Detected data appear Gamma Distributed at 5% Significance Level											
828	Gamma Statistics on Detected Data Only											
829	k hat (MLE)	7.378										k star (bias corrected MLE)
830	Theta hat (MLE)	0.0202										Theta star (bias corrected MLE)
831	nu hat (MLE)	177.1										nu star (bias corrected)
832	Mean (detects)	0.149										
833	Gamma ROS Statistics using Imputed Non-Detects											
834	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
835	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
836	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
837	This is especially true when the sample size is small.											
838	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
839	Minimum	0.0443										Mean
840	Maximum	0.297										Median
841	SD	0.062										CV
842	k hat (MLE)	4.16										k star (bias corrected MLE)
843	Theta hat (MLE)	0.0269										Theta star (bias corrected MLE)
844	nu hat (MLE)	183										nu star (bias corrected)
845	Adjusted Level of Significance (β)	0.0386										
846	Approximate Chi Square Value (159.40, α)	131.2										Adjusted Chi Square Value (159.40, β)
847	95% Gamma Approximate UCL (use when n>=50)	0.136										95% Gamma Adjusted UCL (use when n<50)
848	Estimates of Gamma Parameters using KM Estimates											
849	Mean (KM)	0.122										SD (KM)
850	Variance (KM)	0.00285										SE of Mean (KM)
851	k hat (KM)	5.183										k star (KM)
852	nu hat (KM)	228.1										nu star (KM)
853	theta hat (KM)	0.0235										theta star (KM)
854	80% gamma percentile (KM)	0.165										90% gamma percentile (KM)
855	95% gamma percentile (KM)	0.229										99% gamma percentile (KM)
856	Gamma Kaplan-Meier (KM) Statistics											
857	Approximate Chi Square Value (198.30, α)	166.7										Adjusted Chi Square Value (198.30, β)
858	95% Gamma Approximate KM-UCL (use when n>=50)	0.145										95% Gamma Adjusted KM-UCL (use when n<50)

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L																		
859	Lognormal GOF Test on Detected Observations Only																													
860	Shapiro Wilk Test Statistic 0.96 Shapiro Wilk GOF Test																													
861	5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level																											
862	Lilliefors Test Statistic	0.185	Lilliefors GOF Test																											
863	5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level																											
864	Detected Data appear Lognormal at 5% Significance Level																													
865	Lognormal ROS Statistics Using Imputed Non-Detects																													
866	Mean in Original Scale	0.118	Mean in Log Scale																											
867	SD in Original Scale	0.0569	SD in Log Scale																											
868	95% t UCL (assumes normality of ROS data)	0.139	95% Percentile Bootstrap UCL																											
869	95% BCA Bootstrap UCL	0.142	95% Bootstrap t UCL																											
870	95% H-UCL (Log ROS)	0.139																												
871	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																													
872	KM Mean (logged)	-2.179	KM Geo Mean																											
873	KM SD (logged)	0.358	95% Critical H Value (KM-Log)																											
874	KM Standard Error of Mean (logged)	0.082	95% H-UCL (KM -Log)																											
875	KM SD (logged)	0.358	95% Critical H Value (KM-Log)																											
876	KM Standard Error of Mean (logged)	0.082																												
877	DL/2 Statistics																													
878	DL/2 Normal				DL/2 Log-Transformed																									
879	Mean in Original Scale	0.106	Mean in Log Scale																											
880	SD in Original Scale	0.0657	SD in Log Scale																											
881	95% t UCL (Assumes normality)	0.13	95% H-Stat UCL																											
882	DL/2 is not a recommended method, provided for comparisons and historical reasons																													
883	Nonparametric Distribution Free UCL Statistics																													
884	Detected Data appear Normal Distributed at 5% Significance Level																													
885	Suggested UCL to Use																													
886	95% KM (t) UCL	0.142																												
887																														

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L						
888	Cyanide																	
889	General Statistics																	
890	Total Number of Observations		20				Number of Distinct Observations		16									
891							Number of Missing Observations		2									
892	Number of Detects		4				Number of Non-Detects		16									
893	Number of Distinct Detects		4				Number of Distinct Non-Detects		12									
894	Minimum Detect		0.673				Minimum Non-Detect		0.76									
895	Maximum Detect		3.03				Maximum Non-Detect		1.2									
896	Variance Detects		1				Percent Non-Detects		80%									
897	Mean Detects		1.683				SD Detects		1									
898	Median Detects		1.515				CV Detects		0.594									
899	Skewness Detects		0.897				Kurtosis Detects		1.012									
900	Mean of Logged Detects		0.38				SD of Logged Detects		0.628									
901	Normal GOF Test on Detects Only																	
902	Shapiro Wilk Test Statistic		0.961				Shapiro Wilk GOF Test											
903	5% Shapiro Wilk Critical Value		0.748				Detected Data appear Normal at 5% Significance Level											
904	Lilliefors Test Statistic		0.223				Lilliefors GOF Test											
905	5% Lilliefors Critical Value		0.375				Detected Data appear Normal at 5% Significance Level											
906	Detected Data appear Normal at 5% Significance Level																	
907	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																	
908	KM Mean		0.875				KM Standard Error of Mean		0.145									
909	KM SD		0.56				95% KM (BCA) UCL		N/A									
910	95% KM (t) UCL		1.125				95% KM (Percentile Bootstrap) UCL		N/A									
911	95% KM (z) UCL		1.113				95% KM Bootstrap t UCL		N/A									
912	90% KM Chebyshev UCL		1.309				95% KM Chebyshev UCL		1.505									
913	97.5% KM Chebyshev UCL		1.778				99% KM Chebyshev UCL		2.313									
914	Gamma GOF Tests on Detected Observations Only																	
915	A-D Test Statistic		0.197				Anderson-Darling GOF Test											
916	5% A-D Critical Value		0.659				Detected data appear Gamma Distributed at 5% Significance Level											
917	K-S Test Statistic		0.172				Kolmogorov-Smirnov GOF											
918	5% K-S Critical Value		0.396				Detected data appear Gamma Distributed at 5% Significance Level											
919	Detected data appear Gamma Distributed at 5% Significance Level																	
920	Gamma Statistics on Detected Data Only																	
921	k hat (MLE)		3.705				k star (bias corrected MLE)		1.093									
922	Theta hat (MLE)		0.454				Theta star (bias corrected MLE)		1.54									
923	nu hat (MLE)		29.64				nu star (bias corrected)		8.744									
924	Mean (detects)		1.683															
925	Gamma ROS Statistics using Imputed Non-Detects																	
926	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																	
927	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																	
928	For such situations, GROS method may yield incorrect values of UCLs and BTVs																	
929	This is especially true when the sample size is small.																	
930	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																	
931	Minimum		0.0392				Mean		0.692									
932	Maximum		3.03				Median		0.439									
933	SD		0.672				CV		0.971									
934	k hat (MLE)		1.607				k star (bias corrected MLE)		1.399									
935	Theta hat (MLE)		0.43				Theta star (bias corrected MLE)		0.494									
936	nu hat (MLE)		64.28				nu star (bias corrected)		55.97									
937	Adjusted Level of Significance (β)		0.038															
938	Approximate Chi Square Value (55.97, α)		39.78				Adjusted Chi Square Value (55.97, β)		38.7									
939	95% Gamma Approximate UCL (use when n>=50)		0.973				95% Gamma Adjusted UCL (use when n<50)		N/A									
940	Estimates of Gamma Parameters using KM Estimates																	
941	Mean (KM)		0.875				SD (KM)		0.56									
942	Variance (KM)		0.313				SE of Mean (KM)		0.145									
943	k hat (KM)		2.443				k star (KM)		2.11									
944	nu hat (KM)		97.74				nu star (KM)		84.41									
945	theta hat (KM)		0.358				theta star (KM)		0.415									
946	80% gamma percentile (KM)		1.302				90% gamma percentile (KM)		1.681									
947	95% gamma percentile (KM)		2.041				99% gamma percentile (KM)		2.837									
948	Gamma Kaplan-Meier (KM) Statistics																	
949	Approximate Chi Square Value (84.41, α)		64.24				Adjusted Chi Square Value (84.41, β)		62.85									

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L	
950	95% Gamma Approximate KM-UCL (use when n>=50)				1.15		95% Gamma Adjusted KM-UCL (use when n<50)			1.175			
Lognormal GOF Test on Detected Observations Only													
Shapiro Wilk GOF Test													
952	Shapiro Wilk Test Statistic				0.998		Detected Data appear Lognormal at 5% Significance Level						
953	5% Shapiro Wilk Critical Value				0.748								
954	Lilliefors Test Statistic				0.166		Lilliefors GOF Test						
955	5% Lilliefors Critical Value				0.375		Detected Data appear Lognormal at 5% Significance Level						
956	Detected Data appear Lognormal at 5% Significance Level												
957	Lognormal ROS Statistics Using Imputed Non-Detects												
958	Mean in Original Scale				0.839		Mean in Log Scale			-0.311			
959	SD in Original Scale				0.598		SD in Log Scale			0.467			
960	95% t UCL (assumes normality of ROS data)				1.07		95% Percentile Bootstrap UCL			1.069			
961	95% BCA Bootstrap UCL				1.163		95% Bootstrap t UCL			1.521			
962	95% H-UCL (Log ROS)				1.011								
963	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
964	KM Mean (logged)				-0.241		KM Geo Mean			0.786			
965	KM SD (logged)				0.394		95% Critical H Value (KM-Log)			1.924			
966	KM Standard Error of Mean (logged)				0.102		95% H-UCL (KM -Log)			1.011			
967	KM SD (logged)				0.394		95% Critical H Value (KM-Log)			1.924			
968	KM Standard Error of Mean (logged)				0.102								
969	DL/2 Statistics												
970	DL/2 Normal					DL/2 Log-Transformed							
971	Mean in Original Scale				0.728		Mean in Log Scale			-0.504			
972	SD in Original Scale				0.634		SD in Log Scale			0.531			
973	95% t UCL (Assumes normality)				0.973		95% H-Stat UCL			0.893			
974	DL/2 is not a recommended method, provided for comparisons and historical reasons												
975	Nonparametric Distribution Free UCL Statistics												
976	Detected Data appear Normal Distributed at 5% Significance Level												
977	Suggested UCL to Use												
978	95% KM (t) UCL				1.125								
979													

Sediment 95% UCL Calculations
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	A	B	C	D	E	F	G	H	I	J	K	L							
980	Carbazole																		
981	General Statistics																		
982	Total Number of Observations			22	Number of Distinct Observations			19											
983	Number of Detects			13	Number of Non-Detects			9											
984	Number of Distinct Detects			13	Number of Distinct Non-Detects			8											
985	Minimum Detect			0.0033	Minimum Non-Detect			0.0034											
986	Maximum Detect			0.77	Maximum Non-Detect			0.05											
987	Variance Detects			0.049	Percent Non-Detects			40.91%											
988	Mean Detects			0.101	SD Detects			0.221											
989	Median Detects			0.023	CV Detects			2.188											
990	Skewness Detects			2.794	Kurtosis Detects			7.819											
991	Mean of Logged Detects			-3.86	SD of Logged Detects			1.702											
992	Normal GOF Test on Detects Only																		
993	Shapiro Wilk Test Statistic			0.504	Shapiro Wilk GOF Test														
994	5% Shapiro Wilk Critical Value			0.866	Detected Data Not Normal at 5% Significance Level														
995	Lilliefors Test Statistic			0.45	Lilliefors GOF Test														
996	5% Lilliefors Critical Value			0.234	Detected Data Not Normal at 5% Significance Level														
997	Detected Data Not Normal at 5% Significance Level																		
998	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																		
999	KM Mean			0.0631	KM Standard Error of Mean			0.0377											
1000	KM SD			0.17	95% KM (BCA) UCL			0.133											
1001	95% KM (t) UCL			0.128	95% KM (Percentile Bootstrap) UCL			0.128											
1002	95% KM (z) UCL			0.125	95% KM Bootstrap t UCL			0.664											
1003	90% KM Chebyshev UCL			0.176	95% KM Chebyshev UCL			0.228											
1004	97.5% KM Chebyshev UCL			0.299	99% KM Chebyshev UCL			0.438											
1005	Gamma GOF Tests on Detected Observations Only																		
1006	A-D Test Statistic			1.364	Anderson-Darling GOF Test														
1007	5% A-D Critical Value			0.807	Detected Data Not Gamma Distributed at 5% Significance Level														
1008	K-S Test Statistic			0.325	Kolmogorov-Smirnov GOF														
1009	5% K-S Critical Value			0.253	Detected Data Not Gamma Distributed at 5% Significance Level														
1010	Detected Data Not Gamma Distributed at 5% Significance Level																		
1011	Gamma Statistics on Detected Data Only																		
1012	k hat (MLE)			0.417	k star (bias corrected MLE)			0.372											
1013	Theta hat (MLE)			0.243	Theta star (bias corrected MLE)			0.272											
1014	nu hat (MLE)			10.83	nu star (bias corrected)			9.666											
1015	Mean (detects)			0.101															
1016	Gamma ROS Statistics using Imputed Non-Detects																		
1017	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																		
1018	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)																		
1019	For such situations, GROS method may yield incorrect values of UCLs and BTVs																		
1020	This is especially true when the sample size is small.																		
1021	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																		
1022	Minimum			0.0033	Mean			0.0639											
1023	Maximum			0.77	Median			0.01											
1024	SD			0.174	CV			2.716											
1025	k hat (MLE)			0.456	k star (bias corrected MLE)			0.424											
1026	Theta hat (MLE)			0.14	Theta star (bias corrected MLE)			0.151											
1027	nu hat (MLE)			20.05	nu star (bias corrected)			18.65											
1028	Adjusted Level of Significance (β)			0.0386															
1029	Approximate Chi Square Value (18.65, α)			9.864	Adjusted Chi Square Value (18.65, β)			9.388											
1030	95% Gamma Approximate UCL (use when n>=50)			0.121	95% Gamma Adjusted UCL (use when n<50)			0.127											
1031	Estimates of Gamma Parameters using KM Estimates																		
1032	Mean (KM)			0.0631	SD (KM)			0.17											
1033	Variance (KM)			0.0289	SE of Mean (KM)			0.0377											
1034	k hat (KM)			0.138	k star (KM)			0.15											
1035	nu hat (KM)			6.077	nu star (KM)			6.582											
1036	theta hat (KM)			0.457	theta star (KM)			0.422											
1037	80% gamma percentile (KM)			0.0686	90% gamma percentile (KM)			0.187											
1038	95% gamma percentile (KM)			0.348	99% gamma percentile (KM)			0.814											
1039	Gamma Kaplan-Meier (KM) Statistics																		
1040	Approximate Chi Square Value (6.58, α)			1.944	Adjusted Chi Square Value (6.58, β)			1.762											
1041	95% Gamma Approximate KM-UCL (use when n>=50)			0.214	95% Gamma Adjusted KM-UCL (use when n<50)			0.236											

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	A	B	C	D	E	F	G	H	I	J	K	L																		
1042	Lognormal GOF Test on Detected Observations Only																													
1043	Shapiro Wilk Test Statistic 0.886 Shapiro Wilk GOF Test																													
1044	5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level																											
1045	Lilliefors Test Statistic	0.184	Lilliefors GOF Test																											
1046	5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Level																											
1047	Detected Data appear Lognormal at 5% Significance Level																													
1048	Lognormal ROS Statistics Using Imputed Non-Detects																													
1049	Mean in Original Scale	0.0619	Mean in Log Scale -4.565																											
1050	SD in Original Scale	0.174	SD in Log Scale 1.644																											
1051	95% t UCL (assumes normality of ROS data)	0.126	95% Percentile Bootstrap UCL 0.128																											
1052	95% BCA Bootstrap UCL	0.166	95% Bootstrap t UCL 0.803																											
1053	95% H-UCL (Log ROS)	0.145																												
1054	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution																													
1055	KM Mean (logged)	-4.415	KM Geo Mean 0.0121																											
1056	KM SD (logged)	1.508	95% Critical H Value (KM-Log) 3.356																											
1057	KM Standard Error of Mean (logged)	0.353	95% H-UCL (KM -Log) 0.114																											
1058	KM SD (logged)	1.508	95% Critical H Value (KM-Log) 3.356																											
1059	KM Standard Error of Mean (logged)	0.353																												
1060	DL/2 Statistics																													
1061	DL/2 Normal				DL/2 Log-Transformed																									
1062	Mean in Original Scale	0.0654	Mean in Log Scale -4.218																											
1063	SD in Original Scale	0.173	SD in Log Scale 1.543																											
1064	95% t UCL (Assumes normality)	0.129	95% H-Stat UCL 0.153																											
1065	DL/2 is not a recommended method, provided for comparisons and historical reasons																													
1066	Nonparametric Distribution Free UCL Statistics																													
1067	Detected Data appear Lognormal Distributed at 5% Significance Level																													
1068	Suggested UCL to Use																													
1069	95% KM (Chebyshev) UCL	0.228																												
1070																														